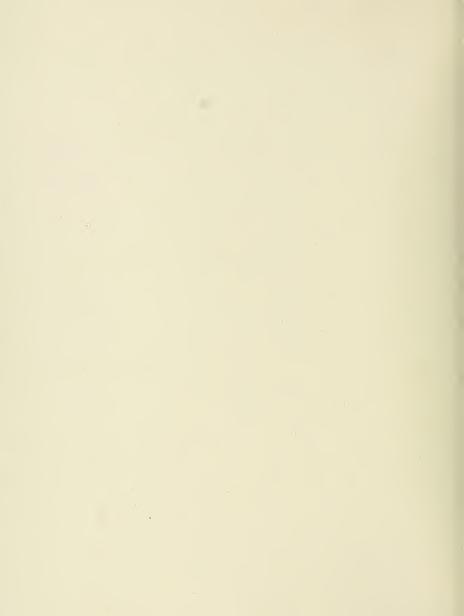94-05-03 09:30 RCVD

DRINKING WATER SURVEILLANCE PROGRAM

TILBURY
WATER TREATMENT
PLANT

REPORT FOR 1991 AND 1992

Ontario

TILBURY WATER TREATMENT PLANT

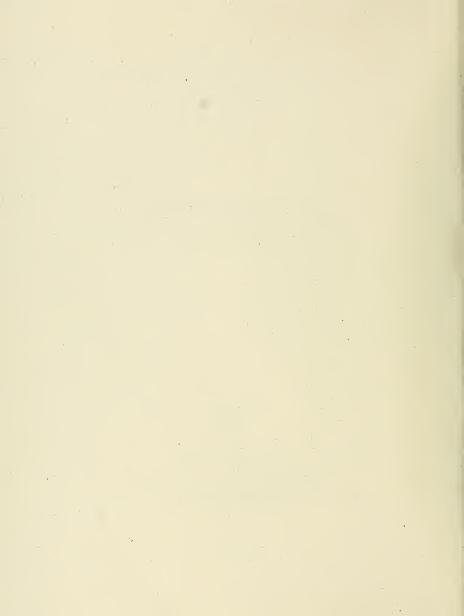# DRINKING WATER SURVEILLANCE PROGRAM

REPORT FOR 1991 AND 1992

APRIL 1994

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PIBS 2977

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

TILBURY WATER TREATMENT PLANT
1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Tilbury water treatment plant is a conventional treatment plant which treats water from Lake St. Clair. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration (pressure filters), taste and odour control, fluoridation and disinfection. Chlorine is added at the mouth of the intake structure for zebra mussel control when the raw water temperature is above 12°C. Polyphosphate is added for corrosion control. This plant has a rated capacity of 6.5 x 1000 m^3/day. The Tilbury water treatment plant serves a population of approximately 6,000.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Tilbury water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE	YOUNG ST TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	48	26	54	17	2	11	17	13	76
CHEMISTRY (FIELD)	53	53	100	99	99	100	154	153	99
CHEMISTRY (LABORATORY)	397	378	95	405	336	82	712	620	87
METALS	408	207	50	408	122	29	782	329	42
CHLOROAROMATICS	168	0	0	181	1	0	182	0	0
CHLOROPHENOLS	24	0	0	24	0	0	.	.	.
PESTICIDES AND PCB	461	1	0	482	2	0	288	2	0
PHENOLICS	17	2	11	17	3	17	.	.	.
POLYAROMATIC HYDROCARBONS	119	0	0	85	0	0	85	0	0
SPECIFIC PESTICIDES	93	0	0	94	0	0	2	0	0
VOLATILES	505	8	1	505	67	13	505	68	13
RADIONUCLIDES	21	3	14	21	3	14	.	.	.
TOTAL	2,314	678		2,338	635		2,727	1185	

DRINKING WATER SURVEILLANCE PROGRAM

TILBURY WATER TREATMENT PLANT
1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Tilbury water treatment plant in the spring of 1990. A previous annual report was published in 1990.

PLANT DESCRIPTION

The Tilbury water treatment plant is a conventional treatment plant which treats water from Lake St. Clair. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration (pressure filters), taste and odour control, fluoridation and disinfection. Chlorine is added at the mouth of the intake structure for zebra mussel control when the raw water temperature is above $12^{\circ}C$. Polyphosphate is added for corrosion control. This plant has a rated capacity of $6.5 \times 1000 \ m^3$/day. The Tilbury water treatment plant serves a population of approximately 6,000.

The sample day flows ranged from $4.0 \times 1000 \ m^3$/day to $7.2 \times 1000 \ m^3$/day.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). These objectives are applied to free flowing water. When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:
   -THE TREATED AND DISTRIBUTED WATER;
   -ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
       GUIDELINE VALUES; AND
   -POSITIVE ORGANIC PARAMETERS DETECTED.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis

conducted on the treated and distributed water. No results were
above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

Field pH was below the ODWO Recommended Operational Guideline of
6.5-8.5 pH units in 1 of 32 treated and distributed water samples
with a minimum reported value of 6.4 pH units.

It is desirable that the temperature of drinking water be less than
15°C. The palatability of water is enhanced by its coolness. A
temperature below 15°C will tend to reduce the growth of nuisance
organisms and hence minimize associated taste, colour, odour and
corrosion problems. The temperature of delivered water may increase
in the distribution system due to the warming effect of soil in
late summer and fall and/or as a result of higher temperatures in
the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in
12 of 31 treated and distributed water samples with a maximum
reported value of 24.0°C.

CHEMISTRY (LABORATORY)

Colour in drinking water may be due to the presence of natural or
synthetic substances as well as certain metallic ions. Colour is
measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 1 of 34
treated and distributed water samples with a maximum reported value
of 13.5 HZU.

Elevated conductivity is often associated with high hardness
levels.

Conductivity exceeded the European Economic Community Aesthetic
Guideline Level of 400 umho/cm in 19 of 34 treated and distributed
water samples with a maximum reported value of 722 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L
as calcium carbonate for domestic waters provides an acceptable
balance between corrosion and encrustation. Water supplies with a
hardness greater than 200 mg/L are considered poor and possess a
tendency to form scale deposits and result in excessive soap
consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of
80-100 mg/L in all 34 treated and distributed water samples with 12
samples above 200 mg/L and a maximum reported value of 317.0 mg/L.

Total phosphorus exceeded the European Economic Community Aesthetic Guideline Level of 0.40 mg/L in 6 of 17 treated water samples with a maximum reported value of 1.17 mg/L. Polyphosphate is added in the treatment process for corrosion control in the distribution system. The presence of slightly elevated phosphate levels in the treated water is therefore expected.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 5 of 34 treated and distributed water samples with a maximum reported value of 170.0 ug/L.

ORGANIC

CHLOROAROMATICS

1,2,4,5-Tetrachlorobenzene was found at a positive level in 1 of the 25 treated and distributed water samples analyzed. The maximum observed level was 11.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 38,000 ng/L.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PESTICIDES AND PCB

Hexachlorocyclopentadiene was found at positive levels in 4 of the 15 treated and distributed water samples analyzed. The maximum observed level was 112.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

Trace levels of atrazine and metolachlor were also detected. The addition of powder activated carbon was effective in reducing the concentrations of pesticides in the treated water.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at positive levels in 3 of the 17 treated and distributed water samples analyzed. The maximum observed level was 3.0 ug/L.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 34 treated and distributed water samples analyzed with a maximum level of 107.0 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

THMs were detected at positive levels in two raw water samples. Where prechlorination is practiced, the operator must ensure that no chlorine is present in the lowlift chamber or discharge line and that the lowlift pumps are in operation for some time before the raw water sample is taken.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

The number of pesticides which were detected at the Tilbury water treatment plant indicates that this raw water source is adversely affected by agricultural activity.

The results are similar to those found in the previous year.

No known health related guidelines were exceeded.

The Tilbury water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

TILBURY WATER TREATMENT PLANT

SCHEMATIC   CHARACTERISTICS

LAKE ST. CLAIR

CHLORINE ADDED AT MOUTH OF INTAKE
FOR ZEBRA MUSSEL CONTROL

1 INFILTRATION BED

1 EMERGENCY RISER INTAKE

1 INTAKE PIPE

1 SCREEN CHAMBER

1 LOWLIFT CHAMBER

3 LOWLIFT PUMPS

POLY ALUMINUM CHLORIDE,
POLYELECTROLYTE AND
POWDER ACTIVATED CARBON
ADDED HERE

RAW WATER SAMPLE SITE

1 UPFLOW SOLIDS
CONTACT CLARIFIER

SODIUM FLUORIDE,
CHLORINE AND
SODIUM POLY PHOSPHATE
ADDED HERE

3 HIGHLIFT PUMPS

6 PRESSURE FILTERS

TREATED WATER SAMPLE SITE

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

```
PLANT NAME:          TILBURY WTP
WORKS #:             220003350
UTM #:               173808574686875


DISTRICT:            WINDSOR
REGION:              SOUTHWEST
DISTRICT OFFICER:    J. DRUMMOND


CHIEF OPERATOR:      GASTON BOUILLON


ADDRESS:             TILBURY WATER TREATMENT PLANT
                     LOT 12, CONC. FRONT
                     DOVER TOWNSHIP
                     519-682-0330


MUNICIPALITY:        TILBURY
AUTHORITY:           MUNICIPAL
```

PLANT INFORMATION
_____

```
                     PLANT VOLUME:      -       (X 1000 M3)
                     DESIGN CAPACITY:   -       (X 1000 M3/DAY)
                     RATED CAPACITY:   6.519    (X 1000 M3/DAY)
```

MUNICIPALITY	POPULATION
TILBURY EAST TOWNSHIP	800
TILBURY NORTH TOWNSHIP	1,200
TOWN OF TILBURY	4,000

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER	LOCATION	FREQUENCY
COMBINED CHLORINE RESIDUAL	TREATED	DAILY
FREE CHLORINE RESIDUAL	TREATED	CONTINUOUS
TOTAL CHLORINE RESIDUAL	TREATED	CONTINUOUS
PH	RAW	EVERY 4 HOURS
	TREATED	EVERY 4 HOURS
TEMPERATURE	RAW	DAILY
TURBIDITY	RAW	CONTINUOUS
	TREATED	CONTINUOUS

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM TILBURY WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	PRE CHLORINATION CHLORINE	COAGULATION POLYALUMINUM CHLORIDE	COAGULATION AID POLYELECTROLYTE	POST CHLORINATION CHLORINE	FLUORIDATION SODIUM FLUORIDE	TASTE AND ODOUR ACTIVATED CARBON POWDER	CORROSION CONTROL SODIUM POLYPHOSPHATE
91 JAN 22	4.40	6.220	.	18.00	.	4.52	1.33	3.50	1.00
91 FEB 19	5.00	4.580	.	24.02	.	1.82	1.01	8.00	.85
91 MAR 19	4.77	6.050	.	27.80	2.60	3.09	1.10	.	.87
91 APR 23	4.00	5.880	.	31.76	.	3.23	1.10	8.00	.
91 MAY 22	4.55	5.880	.	14.00	.	.	.	4.00	.
91 JUN 18	5.00	5.790	.	17.60	.	4.70	3.33	3.00	.85
91 JUL 16	5.00	4.360	.	15.00	.	2.59	.	8.00	.80
91 AUG 20	4.30	6.390	.	16.00	.	4.19	1.16	6.76	.85
91 SEP 17	4.20	6.650	.	17.50	.	3.38	1.10	6.40	1.06
91 OCT 22	4.20	6.390	.	23.00	.20	3.20	1.40	6.00	.90
91 NOV 19	4.00	6.060	.	.	.	1.64	1.20	6.00	.94
92 FEB 18	3.19	7.260	.	3.77	.	3.13	.97	.	1.01
92 APR 22	4.30	7.260	1.69	14.28	.	2.81	1.24	3.60	1.07
92 JUN 16	3.00	6.020	.	8.40	.	1.50	1.10	6.00	2.04
92 AUG 18	5.00	7.000	.	8.60	.	4.40	1.10	6.10	1.42
92 OCT 27	4.98	4.000	2.20	22.90	.	3.19	1.20	3.17	1.81
92 DEC 15	9.00	7.080	.	20.00	.	3.89	1.40	7.00	1.80

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

A   ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline
5. Health Related Guidance Value

B   HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)

C   WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D   US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F   EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G   CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I   NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!48	No Data: Sample Age Exceeded 48 Hours
!AR	No Data: No Numeric Results
!AW	No Data: Analysis Withdrawn
!BT	No Data: Sample Broken In Transit
!CS	No Data: Contamination Suspected
!EF	No Data: Laboratory Equipment Failure
!IR	No Data: Insufficient Sample
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedure Error: Sample Discarded
!PR	No Data: Preservative Required
!QU	No Data: Quality Control Unacceptable
!RE	No Data: Received Empty
!RO	No Data: No Numeric Results
!SM	No Data: Sample Missing
!SS	No Data: Sample Improperly Preserved
!U	No Data: Sample Unsuitable For Analysis
!UB	No Data: Bottle Broken
!UN	No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

FECAL COLIFORM MF (CT/100ML)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
		DET'N LIMIT = 0	DET'N LIMIT = 0	GUIDELINE = 0 (A1)
1991 JAN	140	.	.	.
1991 FEB	BDL	.	.	.
1991 MAR	BDL	.	.	.
1991 APR	60 <=>	.	.	.
1991 MAY	2	.	.	.
1991 JUN	BDL	.	.	.
1991 JUL	BDL	.	.	.
1991 AUG	4 <=>	.	.	.
1991 SEP	4	.	.	.
1991 OCT	BDL	.	.	.
1992 FEB	10 <=>	.	.	.
1992 APR	BDL	.	.	.
1992 JUN	BDL	.	.	.
1992 AUG	0	.	.	.
1992 OCT	BDL	.	.	.
1992 DEC	12	.	.	.

STANDRD PLATE CNT MF (CT/ML)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
		DET'N LIMIT = 0	DET'N LIMIT = 0	GUIDELINE = 500 (A3)
1991 JAN	.	4 <=>	1 <=>	
1991 FEB	.	2 <=>	10	
1991 MAR	.	6 <=>	31	
1991 APR	.	4 <=>	5 <=>	
1991 MAY	.	1 <=>	54	
1991 JUN	.	4 <=>	0 <=>	
1991 JUL	.	4 <=>	51	
1991 AUG	.	9 <=>	165	
1991 SEP	.	3 <=>	450	
1991 OCT	.	1 <=>	12	
1991 NOV	.	2 <=>	12	
1992 FEB	.	29	17	
1992 APR	.	20	10	
1992 JUN	.	2 <=>	310	
1992 AUG	.	5 <=>	100	
1992 OCT	.	8 <=>	12	
1992 DEC	.	1 <=>	3 <=>	

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP
TABLE 4

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

TOTAL COLIFORM MF (CT/100ML)   DET'N LIMIT = 0   GUIDELINE = 5/100ML (A1)

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	42000			
1991 FEB	1900			
1991 MAR	BDL			
1991 APR	4000 A3C			
1991 MAY	200 <=>			
1991 JUN	120 <=>			
1991 JUL	20 <=>			
1991 AUG	33 <=>			
1991 SEP	60 <=>			
1991 OCT	60 <=>			
1992 FEB	280			
1992 APR	BDL			
1992 JUN	BDL			
1992 AUG	190 A3C			
1992 OCT	740 A3C			
1992 DEC	2400			

T COLIFORM BCKGRD MF (CT/100ML)   DET'N LIMIT = 0   GUIDELINE = N/A

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	10000			
1991 FEB	5800			
1991 MAR	200			
1991 APR	52000 A3C			
1991 MAY	20000 A3C			
1991 JUN	36000 A3C			
1991 JUL	24000 A3C			
1991 AUG	24833 A3C			
1991 SEP	20000 A3C			
1991 OCT	11600 A3C			
1992 FEB	2720			
1992 APR	180 <=>			
1992 JUN	6300 A3C			
1992 AUG	24000 >			
1992 OCT	5900 A3C			
1992 DEC	25000			

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

CHEMISTRY (FIELD)

FLD CHLORINE (COMB) (MG/L)

GUIDELINE = N/A

DET'N LIMIT = 0

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	.	.230	.200	.200
1991 FEB	.	.310	.200	.200
1991 MAR	.	.270	.600	.200
1991 APR	.	.530	.200	.200
1991 MAY	.	.200	.200	.200
1991 JUN	.	.320	.200	.400
1991 JUL	.	.300	.	.
1991 AUG	.	.260	.200	.000
1991 SEP	.	.	.300	.300
1991 OCT	.	.220	.200	.200
1991 NOV	.	.350	.200	.400
1992 FEB	.	.460	.200	.200
1992 APR	.480	.240	.200	.400
1992 JUN	.	.310	.300	.300
1992 AUG	.	.330	.200	.200
1992 OCT	.	.720	.200	.400
1992 DEC	.	.410	.400	.200

FLD CHLORINE FREE (MG/L)

GUIDELINE = N/A

DET'N LIMIT = 0

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	.	2.030	1.100	1.000
1991 FEB	.	2.490	1.300	1.100
1991 MAR	.	1.170	1.100	1.300
1991 APR	.	1.760	1.100	1.100
1991 MAY	.	1.650	.500	.500
1991 JUN	.	3.000	.600	.100
1991 JUL	.	2.510	.	.
1991 AUG	.	2.200	.300	.300
1991 SEP	.	.	.700	.700
1991 OCT	.	1.640	.900	.900
1991 NOV	.	1.870	.900	.700
1992 FEB	.	1.510	.700	.300
1992 APR	.050	1.620	1.300	.700
1992 JUN	.	1.500	.700	.600
1992 AUG	.	2.050	.100	.100
1992 OCT	.	2.080	.300	.300
1992 DEC	.	2.150	.	1.900

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

CHEMISTRY (FIELD)

FLD CHLORINE (TOTAL) (MG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = 0	GUIDELINE = N/A
1991 JAN	.	2.260	1.300	1.200
1991 FEB	.	2.800	1.500	1.300
1991 MAR	.	1.440	1.700	1.500
1991 APR	.	2.290	1.300	1.500
1991 MAY	.	1.850	.700	1.300
1991 JUN	.	3.320	1.000	.700
1991 JUL	.	2.810		.500
1991 AUG	.	2.460		
1991 SEP	.		.500	.300
1991 OCT	.		1.000	1.000
1991 NOV	.	1.860	1.100	1.100
1991 DEC	.	2.220	1.100	1.100
1992 FEB		1.980	.900	.500
1992 APR	.530	1.860	1.500	1.100
1992 JUN	.	1.810	1.000	.900
1992 AUG	.	2.380	.300	.300
1992 OCT	.	2.800	.700	.700
1992 DEC		2.560	.	2.100

FLD PH (OMNSLESS)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A4)
1991 JAN	7.600	7.800	7.700	7.600
1991 FEB	6.800	6.900	7.400	7.600
1991 MAR	6.700	6.700	7.400	7.400
1991 APR	6.700	6.700	7.400	7.800
1991 MAY	7.400	6.900	7.400	7.600
1991 JUN	7.400	7.000	7.400	7.400
1991 JUL	6.900	6.800		
1991 AUG	6.500	6.500	7.600	7.400
1991 SEP	6.800	6.700	7.400	7.400
1991 OCT	7.000	6.900	7.300	7.400
1991 NOV	6.400	6.400	7.600	7.600
1991 DEC	7.600	7.500	7.800	7.600
1992 FEB	6.600	6.500	7.600	7.400
1992 APR	6.800	6.900	7.600	7.400
1992 JUN	7.100	7.000	7.400	7.400
1992 OCT	7.200	7.000	7.400	7.400

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

FLD TEMPERATURE (DEG.C) CHEMISTRY (FIELD) DET'N LIMIT = N/A   GUIDELINE = 15 (A3)

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	1.000	2.000	4.000	12.200
1991 FEB	1.000	1.000	3.000	12.000
1991 MAR	3.000	3.000	4.000	13.000
1991 APR	8.000	8.000	9.500	13.500
1991 MAY	16.000	16.000	15.600	17.500
1991 JUN	22.000	22.000	20.000	20.000
1991 JUL	23.000	22.000		
1991 AUG	22.000	23.000	22.700	22.500
1991 SEP	22.000	22.000	24.000	24.000
1991 OCT	8.000	8.000	13.000	17.000
1991 NOV	5.000	5.000	8.500	11.000
1992 FEB	2.400	2.800	4.500	15.000
1992 APR	9.300	9.300	9.000	15.000
1992 JUN	20.100	20.100		18.500
1992 AUG	22.000	22.000	19.800	20.000
1992 OCT	9.500	9.500	12.000	17.000
1992 DEC	1.600	1.600		5.000

FLD TURBIDITY (FTU)   DET'N LIMIT = N/A   GUIDELINE = 1.0 (A1)

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	30.000	.200	·	·
1991 FEB	22.000	.170	·	·
1991 MAR		.200	·	·
1991 APR	80.000	.200	·	·
1991 MAY	10.000	.100	·	·
1991 JUN	20.000	.150	·	·
1991 JUL	8.000	.170	·	·
1991 AUG	18.000	.120	·	·
1991 SEP	15.000	.140	·	·
1991 OCT	40.000	.200	·	·
1991 NOV	18.000	.200	·	·
1992 FEB	2.890	.160	·	·
1992 APR	55.000	.120	·	·
1992 JUN	1.500	.080	·	·
1992 AUG	3.000	.200	·	·
1992 OCT	38.000	.100	·	·
1992 DEC	30.000	.200	·	·

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
ALKALINITY (MG/L)	>	CHEMISTRY (LABORATORY)	DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)
1991 JAN	219.500	204.500	202.900	202.700
1991 FEB	220.800	157.000	171.900	165.200
1991 MAR	!!s	107.600	113.700	113.300
1991 APR	170.500	148.300	141.100	141.700
1991 MAY	106.500	101.400	109.700	107.500
1991 JUN	126.500	127.000	124.200	127.800
1991 JUL	74.100	72.000	71.000	71.200
1991 AUG	97.300	88.300	85.900	87.800
1991 SEP	99.500	88.000	87.900	89.600
1991 OCT	122.300	111.100	106.300	106.200
1991 NOV	118.200	114.800	111.600	112.600
1992 FEB	193.200	196.800	182.900	195.000
1992 APR	114.800	99.200	97.000	97.700
1992 JUN	101.700	99.500	108.100	103.300
1992 AUG	105.300	98.500	118.700	110.200
1992 OCT	244.300	153.000	167.600	165.700
1992 DEC	137.200	120.400	147.100	152.200
CALCIUM (MG/L)	>		DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)
1991 JAN	97.600	97.200	97.800	94.000
1991 FEB	90.700	72.000	78.700	74.400
1991 MAR	41.000	47.500	50.800	51.200
1991 APR	76.000	72.800	68.000	67.000
1991 MAY	40.000	41.200	48.800	46.800
1991 JUN	47.800	55.000	54.800	55.600
1991 JUL	22.400	25.700	25.800	25.900
1991 AUG	35.400	33.400	33.800	34.600
1991 SEP	32.400	32.800	32.800	33.900
1991 OCT	46.200	46.000	49.000	49.400
1991 NOV	44.400	46.200	46.000	45.600
1992 FEB	82.400	84.800	89.300	90.500
1992 APR	44.500	40.100	39.700	39.450
1992 JUN	35.900	37.700	42.500	40.800
1992 AUG	39.750	40.650	48.650	46.200
1992 OCT	94.400	61.800	68.500	68.000
1992 DEC	48.500	50.600	59.350	60.950
CYANIDE (MG/L)	>		DET'N LIMIT = 0.001	GUIDELINE = 0.2 (A1)
26 SAMPLES	BDL	BDL	·	·

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

CHEMISTRY (LABORATORY)

CHLORIDE (MG/L)   GUIDELINE = 250 (A3)

	)		DET'N LIMIT = 0.20	
1991 JAN	50.500	57.700	50.300	50.300
1991 FEB	39.000	44.200	46.800	46.000
1991 MAR	16.800	28.200	33.500	31.900
1991 APR	23.900	34.000	33.500	33.700
1991 MAY	15.700	21.200	25.500	24.500
1991 JUN	26.800	37.900	36.800	36.800
1991 JUL	16.600	24.800	25.800	25.800
1991 AUG	28.200	33.200	31.500	32.000
1991 SEP	25.900	30.500	32.000	32.000
1991 OCT	32.400	40.100	44.900	42.400
1991 NOV	25.000	34.100	33.700	33.500
1992 FEB	58.300	59.800	63.400	62.700
1992 APR	19.500	22.200	19.900	20.100
1992 JUN	12.800	19.100	21.900	20.600
1992 AUG	15.500	21.700	29.200	26.400
1992 OCT	30.000	29.700	33.200	32.700
1992 DEC	16.200	31.600	30.300	31.000

COLOUR (HZU)   GUIDELINE = 5 (A3)

	)		DET'N LIMIT = 0.50	
1991 JAN	17.500	3.000	2.500	3.000
1991 FEB	10.500	BDL	.500 <T	.500 <T
1991 MAR	3.000	1.000 <T	.500 <T	1.000 <T
1991 APR	8.000	.500 <T	1.000 <T	1.000 <T
1991 MAY	4.500	BDL	1.000 <T	1.000 <T
1991 JUN	7.500	1.000 <T	13.500	1.500
1991 JUL	4.000	BDL	.500 <T	.500 <T
1991 AUG	5.000	.500 <T	1.000 <T	.500 <T
1991 SEP	5.000	.500 <T	.500 <T	.500 <T
1991 OCT	.500 <T	.500 <T	3.000	.500 <T
1991 NOV	2.500	BDL	.500 <T	.500 <T
1992 FEB	7.500	3.000	3.000	3.500
1992 APR	BDL	BDL	.500 <T	.500 <T
1992 JUN	4.000	.500 <T	.500 <T	.500 <T
1992 AUG	6.000	.500 <T	2.000	1.500
1992 OCT	10.500	1.000	2.500	3.000
1992 DEC	5.000	BDL	.500 <T	.500 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

CHEMISTRY (LABORATORY)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)
1991 JAN	673	683	661	664
1991 FEB	617	529	571	555
1991 MAR	115	375	409	404
1991 APR	505	505	469	474
1991 MAY	299	314	363	350
1991 JUN	413	464	454	458
1991 JUL	240	271	270	271
1991 AUG	336	346	330	337
1991 SEP	340	340	345	349
1991 OCT	420	435	444	434
1991 NOV	380	415	413	413
1992 FEB	718	722	701	728
1992 APR	362	351	308	308
1992 JUN	281	310	342	328
1992 AUG	315	337	413	380
1992 OCT	589	444	487	481
1992 DEC	359	393	440	457
DISS ORG CARBON (MG/L)			DET'N LIMIT = 0.10	GUIDELINE = 5.0 (A3)
1991 JAN	4.300	3.100	3.100	3.100
1991 FEB	3.500	2.100	2.200	2.400
1991 MAR	2.600	2.000	2.000	2.000
1991 APR	4.500	2.300	2.300	2.400
1991 MAY	2.600	1.800	2.100	2.100
1991 JUN	3.200	2.000	2.400	2.300
1991 JUL	2.900	1.800	1.700	1.900
1991 AUG	3.100	1.900	1.800	1.800
1991 SEP	3.000	1.600	1.700	1.800
1991 OCT	2.800	1.900	1.600	1.600
1991 NOV	2.800	2.200	2.000	2.000
1992 FEB	3.000	3.200	3.300	3.300
1992 APR	3.600	1.800	1.600	1.400
1992 JUN	1.700	1.200	1.200	1.300
1992 AUG	2.300	1.800	2.000	1.900
1992 OCT	5.000	2.800	3.400	3.500
1992 DEC	2.500	1.500	1.700	1.900

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
FLUORIDE (MG/L)	CHEMISTRY (LABORATORY)			GUIDELINE = 1.5 (A1)
			DET'N LIMIT = 0.01	
1991 JAN	.180	1.260	1.160	1.180
1991 FEB	.160	.960	.980	.940
1991 MAR	.160	.840	.940	.980
1991 APR	.160	1.000	.880	.860
1991 MAY	.100	1.140	1.120	1.120
1991 JUN	.160	.940	.920	.920
1991 JUL	.120	.540	.540	.540
1991 AUG	.180	1.080	.980	.980
1991 SEP	.200	.940	1.000	.980
1991 OCT	.240	1.060	1.040	1.040
1991 NOV	.160	1.040	1.020	1.020
1992 FEB	.180	.840	.840	.840
1992 APR	.180	1.080	1.100	1.120
1992 JUN	.100	1.060	1.120	1.020
1992 AUG	.160	1.140	1.000	1.000
1992 OCT	.160	1.220	1.100	1.100
1992 DEC	.100	1.100	1.000	1.060

HARDNESS (MG/L)				GUIDELINE = 80-100 (A4)
			DET'N LIMIT = 0.5	
1991 JAN	317.000	316.000	317.000	310.000
1991 FEB	297.300	239.300	258.800	247.500
1991 MAR	145.300	164.000	174.400	174.800
1991 APR	262.000	251.000	235.000	232.000
1991 MAY	143.000	146.000	171.000	165.000
1991 JUN	177.000	196.000	195.000	197.000
1991 JUL	95.400	102.700	102.600	103.100
1991 AUG	137.000	132.000	131.000	133.000
1991 SEP	128.300	125.000	127.600	130.600
1991 OCT	168.300	168.000	176.500	174.000
1991 NOV	162.300	169.100	166.500	164.500
1992 FEB	282.000	285.000	298.000	300.000
1992 APR	151.000	136.000	136.200	134.900
1992 JUN	124.000	130.000	146.000	140.000
1992 AUG	137.140	141.070	229.950	160.310
1992 OCT	309.000	208.000	229.000	227.000
1992 DEC	165.750	171.990	200.300	205.560

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
IONCAL (DMNSLESS)	CHEMISTRY (LABORATORY)		DET'N LIMIT = N/A	GUIDELINE = N/A
1991 JAN	.883	2.466	3.903	1.738
1991 FEB	.741 NAF	1.108 NAF	1.672 NAF	.420 NAF
1991 MAR	.000 NAF	1.669 RID	3.687 NAF	1.507 NAF
1991 APR	1.479 NAF	1.864 NAF	4.478 NAF	2.317 NAF
1991 MAY	2.674 NAF	3.638 NAF	7.314 NAF	6.545 NAF
1991 JUN	.817 NAF	2.154 NAF	2.254 NAF	1.753 NAF
1991 JUL	2.413 NAF	2.614 NAF	5.063 NAF	4.787 NAF
1991 AUG	4.751	1.969	4.622	3.845
1991 SEP	3.132 NAF	2.240 NAF	2.464 NAF	1.455 NAF
1991 OCT	2.681 NAF	3.952 NAF	4.670 NAF	3.996 NAF
1991 NOV	2.374	.561	.030	1.303
1992 FEB	4.235	3.458	3.451	.240
1992 APR	3.754	2.746	2.756	1.157
1992 JUN	.125 NAF	1.579 NAF	2.038 NAF	2.326 NAF
1992 AUG	.124	2.124	.188	2.057
1992 OCT	.269	.884	.368	.599
1992 DEC	2.264	.970	.506	.460
POTASSIUM (MG/L)			DET'N LIMIT = 0.01	GUIDELINE = 10 (F2)
1991 JAN	3.250	3.000	2.920	2.850
1991 FEB	3.390	2.490	2.860	2.790
1991 MAR	1.780	1.640	1.740	1.710
1991 APR	1.950	1.550	1.950	1.950
1991 MAY	1.450	1.400	1.750	1.600
1991 JUN	2.350	2.500	2.650	2.650
1991 JUL	1.120	1.460	1.350	1.340
1991 AUG	2.200	2.000	1.800	1.950
1991 SEP	2.140	1.860	1.930	1.990
1991 OCT	3.500	3.200	2.950	2.900
1991 NOV	2.580	2.650	2.560	2.600
1992 FEB	3.020	2.800	3.070	3.080
1992 APR	2.623	1.930	1.500	1.473
1992 JUN	1.600	1.570	1.670	1.590
1992 AUG	1.969	2.019	2.374	2.280
1992 OCT	3.892	2.900	3.457	3.428
1992 DEC	2.530	1.935	2.201	2.294

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

CHEMISTRY (LABORATORY)

LANGELIERS INDEX (DIMNSLESS)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = N/A	GUIDELINE = N/A
1991 JAN	1.146	.913	1.023	.975
1991 FEB	1.229 NAF	.780 NAF	.743 NAF	.763 NAF
1991 MAR		.630 RID	.640	.672
1991 APR	.971	.762	.774	.719
1991 MAY	.431	.288	.491	.505
1991 JUN	.599	.427	.587	.555
1991 JUL	.404	-.200	-.014	-.132
1991 AUG	.552	-.026	.149	.098
1991 SEP	.373	.195	.114	.126
1991 OCT	.619	.454	.301	.375
1991 NOV	.431	.382	.338	.268
1992 FEB	1.185	1.135	1.127	1.119
1992 APR	.541	.363	.313	.294
1992 JUN	.451	.442	.547	.521
1992 AUG	.379	.168	.419	.348
1992 OCT	1.233	.700	.750	.703
1992 DEC	.706	.394	.516	.551

MAGNESIUM (MG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)
1991 JAN	17.800	17.900	17.700	18.300
1991 FEB	17.250	14.400	15.150	15.000
1991 MAR	10.400	11.100	11.550	11.400
1991 APR	17.600	16.800	15.800	15.700
1991 MAY	10.600	10.400	12.000	11.700
1991 JUN	13.900	14.300	14.100	14.200
1991 JUL	9.550	9.350	9.250	9.300
1991 AUG	11.800	11.700	11.500	11.300
1991 SEP	11.500	10.450	11.100	11.150
1991 OCT	12.800	12.800	12.900	12.300
1991 NOV	12.500	13.050	12.550	12.750
1992 FEB	18.600	17.900	18.200	18.100
1992 APR	10.230	9.570	9.000	8.840
1992 JUN	8.220	8.710	9.640	9.300
1992 AUG	9.210	9.620	11.880	10.920
1992 OCT	17.800	13.000	14.100	13.900
1992 DEC	10.860	11.100	12.600	12.960

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
SODIUM (MG/L)	**CHEMISTRY (LABORATORY)**		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)
1991 JAN	23.000	24.200	21.200	21.300
1991 FEB	18.800	17.100	19.100	18.500
1991 MAR	6.900	9.000	10.300	10.800
1991 APR	9.000	9.400	9.800	9.800
1991 MAY	8.200	9.400	11.000	10.600
1991 JUN	14.600	16.600	14.800	15.200
1991 JUL	9.600	10.900	10.400	10.500
1991 AUG	18.200	18.400	16.600	17.200
1991 SEP	15.700	15.300	15.400	15.800
1991 OCT	21.200	22.200	20.600	19.600
1991 NOV	15.300	18.100	17.600	17.700
1992 FEB	29.800	30.700	32.300	31.000
1992 APR	9.010	9.840	9.470	9.710
1992 JUN	8.570	11.500	12.500	11.400
1992 AUG	8.810	11.040	14.200	13.070
1992 OCT	12.930	11.640	12.910	12.710
1992 DEC	8.010	10.500	11.370	11.930

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)
1991 JAN	.174	.002 <T	BDL	BDL
1991 FEB	.208	BDL	BDL	BDL
1991 MAR	.044	BDL	BDL	BDL
1991 APR	.016	BDL	BDL	BDL
1991 MAY	.050	BDL	.002 <T	.002 <T
1991 JUN	.058	BDL	.002 <T	.004 <T
1991 JUL	.026	.004 <T	BDL	.002 <T
1991 AUG	.020	BDL	.002 <T	BDL
1991 SEP	.032	BDL	BDL	.002 <T
1991 OCT	.046	BDL	BDL	BDL
1991 NOV	.044	.006 <T	.004 <T	.010
1992 FEB	.102	BDL	BDL	.006 <T
1992 APR	.052	.002 <T	.004 <T	.002 <T
1992 JUN	.022	BDL	BDL	.004 <T
1992 AUG	.092	.002 <T	.004 <T	.008 <T
1992 OCT	.006 <T	BDL	.012	BDL
1992 DEC	.018		BDL	

NITRITE (MG/L)

CHEMISTRY (LABORATORY)

DET'N LIMIT = 0.001   GUIDELINE = 1.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
1991 JAN	.050	BDL	.002 <T	.002 <T
1991 FEB	.046	BDL	.001 <T	.001 <T
1991 MAR	.015	BDL	BDL	BDL
1991 APR	.032	BDL	BDL	BDL
1991 MAY	.014	BDL	BDL	.001 <T
1991 JUN	.036	BDL	BDL	.001 <T
1991 JUL	.004 <T	BDL	BDL	BDL
1991 AUG	.016	BDL	BDL	BDL
1991 SEP	.013	BDL	BDL	BDL
1991 OCT	.031	BDL	BDL	BDL
1991 NOV	.023	BDL	BDL	BDL
1992 FEB	.027	BDL	.002 <T	.001 <T
1992 APR	.025	BDL	BDL	.003 <T
1992 JUN	.007	BDL	.001 <T	BDL
1992 AUG	.024	BDL	.002 <T	.001 <T
1992 OCT	.009	BDL	BDL	.001 <T
1992 DEC	.025	BDL	BDL	BDL

NITRATE (TOTAL) (MG/L)

DET'N LIMIT = 0.005   GUIDELINE = 10.0 (A1)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
1991 JAN	6.320	6.230	6.400	6.380
1991 FEB	5.730	4.020	4.550	4.340
1991 MAR	1.920	2.600	3.100	3.040
1991 APR	7.500	6.900	4.750	4.990
1991 MAY	1.200	1.250	1.860	1.730
1991 JUN	2.670	3.250	3.120	3.210
1991 JUL	.125	.205	.225	.225
1991 AUG	.535	.535	.590	.615
1991 SEP	.385	.395	.425	.435
1991 OCT	1.160	1.120	.955	.905
1991 NOV	1.260	1.400	1.450	1.450
1992 FEB	7.430	7.050	7.630	7.680
1992 APR	4.120	3.370	1.370	1.200
1992 JUN	.560	.755	1.020	.965
1992 AUG	1.640	1.820	2.760	2.330
1992 OCT	4.870	2.750	3.430	3.360
1992 DEC	1.800	1.810	2.440	2.600

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

CHEMISTRY (LABORATORY)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
NITROGEN TOT KJELD (MG/L)		GUIDELINE = N/A	DET'N LIMIT = 0.02	
1991 JAN	.870	.410	.400	.400
1991 FEB	.840	.260	.320	.330
1991 MAR	.450	.240	.240	.250
1991 APR	1.120	.290	.300	.310
1991 MAY	.420	.160	.220	.210
1991 JUN	.550	.220	.240	.290
1991 JUL	.340	.110	.140	.140
1991 AUG	.360	.100	.180	.120
1991 SEP	.410	.130	.150	.150
1991 OCT	.530	.220	.170	.170
1991 NOV	.420	.230	.230	.240
1992 FEB	.450	1.850	2.050	1.950
1992 APR	.700	.280	.130	.140
1992 JUN	.180	.090 <T	.140	.140
1992 AUG	.400	.130	.260	.210
1992 OCT	.790	.320	.400	.390
1992 DEC	.480	.130	.230	.250
PH (DMNSLESS)		GUIDELINE = 6.5-8.5 (A4)	DET'N LIMIT = N/A	
1991 JAN	8.290	8.090	8.200	8.170
1991 FEB	8.400	8.190	8.080	8.140
1991 MAR	IIS	8.370	8.330	8.360
1991 APR	8.320	8.190	8.250	8.200
1991 MAY	8.240	8.110	8.210	8.250
1991 JUN	8.270	8.040	8.210	8.160
1991 JUL	8.600	7.960	8.150	8.030
1991 AUG	8.460	7.950	8.130	8.060
1991 SEP	8.310	8.180	8.100	8.090
1991 OCT	8.320	8.200	8.040	8.110
1991 NOV	8.160	8.110	8.080	8.010
1992 FEB	8.460	8.390	8.390	8.350
1992 APR	8.280	8.210	8.170	8.150
1992 JUN	8.320	8.310	8.330	8.340
1992 AUG	8.200	8.010	8.110	8.090
1992 OCT	8.340	8.180	8.150	8.110
1992 DEC	8.330	8.060	8.030	8.040

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
PHOSPHORUS FIL REACT (MG/L)	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.0005	GUIDELINE = N/A
1991 JAN	.065	.115		
1991 FEB	.058	.138		
1991 MAR	.026	.081		
1991 APR	.009	.007		
1991 MAY	.003	.003		
1991 JUN	.005	.088		
1991 JUL	.002 <T	.052		
1991 AUG	.003	.122		
1991 SEP	.002	.215		
1991 OCT	.006	.230		
1991 NOV	.004	.212		
1992 FEB	.014	.208		
1992 APR	.054	.136		
1992 JUN	.002 <T	.280		
1992 AUG	.001 <T	.245		
1992 OCT	.045	.260		
1992 DEC	.027	.275		
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = 0.40 (F2)
1991 JAN	.104	.310		
1991 FEB	.089	.405		
1991 MAR	.056	.041		
1991 APR	.206	.011		
1991 MAY	.042	.008 <T		
1991 JUN	.049	.163		
1991 JUL	.028	.121		
1991 AUG	.027	.200		
1991 SEP	.033	.220		
1991 OCT	.060	.405		
1991 NOV	.044	.400		
1992 FEB	.031	.380		
1992 APR	.104	.193		
1992 JUN	.008 <T	.930		
1992 AUG	.011	.655		
1992 OCT	.103	1.030		
1992 DEC	.054	1.170		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

RESIDUE FILTRATE (MG/L) CHEMISTRY (LABORATORY) DET'N LIMIT = N/A GUIDELINE = 500 (A3)

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	437.000 CRO	444.000 CRO	430.000 CRO	432.000 CRO
1991 FEB	401.000 CRO	344.000 CRO	371.000 CRO	361.000 CRO
1991 MAR	202.000 CRO	239.000 CRO	266.000 CRO	263.000 CRO
1991 APR	328.000 CRO	328.000 CRO	305.000 CRO	308.000 CRO
1991 MAY	194.000 CRO	204.000 CRO	236.000 CRO	227.000 CRO
1991 JUN	268.000 CRO	302.000 CRO	295.000 CRO	298.000 CRO
1991 JUL	176.000 CRO	176.000 CRO	176.000 CRO	176.000 CRO
1991 AUG	218.000 CRO	225.000 CRO	214.000 CRO	219.000 CRO
1991 SEP	221.000 CRO	221.000 CRO	224.000 CRO	227.000 CRO
1991 OCT	273.000 CRO	283.000 CRO	289.000 CRO	282.000 CRO
1991 NOV	247.000 CRO	270.000 CRO	268.000 CRO	268.000 CRO
1992 FEB	467.000 CRO	469.000 CRO	456.000 CRO	473.000 CRO
1992 APR	235.000 CRO	228.000 CRO	200.000 CRO	200.000 CRO
1992 JUN	183.000 CRO	202.000 CRO	222.000 CRO	213.000 CRO
1992 AUG	205.000 CRO	219.000 CRO	268.000 CRO	247.000 CRO
1992 OCT	383.000 CRO	289.000 CRO	317.000 CRO	313.000 CRO
1992 DEC	233.000	255.000	286.000	297.000

SULPHATE (MG/L) DET'N LIMIT = 0.20 GUIDELINE = 500 (A3)

	RAW	TREATED	FREE FLOW	STANDING
1991 JAN	52.940	53.480	54.100	55.080
1991 FEB	42.770	40.900	43.070	42.690
1991 MAR	26.280	31.010	32.860	32.840
1991 APR	47.150	45.490	40.470	41.100
1991 MAY	25.080	25.160	30.320	28.930
1991 JUN	34.480	36.890	36.540	36.950
1991 JUL	21.450	22.900	24.010	24.170
1991 AUG	30.900	32.360	28.930	29.990
1991 SEP	31.610	30.410	31.670	32.220
1991 OCT	39.230	38.250	39.310	40.860
1991 NOV	34.970	41.000	41.910	38.810
1992 FEB	61.580	59.210	57.600	57.630
1992 APR	24.850	24.250	23.450	24.690
1992 JUN	21.680	24.340	27.750	26.210
1992 AUG	24.860	27.420	33.510	30.720
1992 OCT	35.620	28.810	32.580	32.310
1992 DEC	23.220	26.670	28.960	29.040

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.05	GUIDELINE = 1.0 (A1)
TURBIDITY (FTU)				
1991 JAN	27.000	.430	.420	.190
1991 FEB	24.000 RRV	.410	.450	.380
1991 MAR	14.600	.520	.390	.320
1991 APR	111.000	.190 <T	.320	.260
1991 MAY	11.800	.650	.520	.170 <T
1991 JUN	9.300	.170	.390	.340
1991 JUL	4.300	.340	.330	.340
1991 AUG	13.600	.400	.440	.350
1991 SEP	7.500	.460	.450	.430
1991 OCT	41.000	.300	.470	.300
1991 NOV	15.100	.360	.430	.390
1992 FEB	3.400	.200 <T	.430	.270
1992 APR	59.000	.360	.510	.390
1992 JUN	1.200	.170 <T	.190 <T	.240 <T
1992 AUG	1.400	.340	.340	.470
1992 OCT	42.000	.320	.430	.290
1992 DEC	39.200	.540	1.050 RRV	1.110 RRV

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

SILVER (UG/L)

	TREATMENT PLANT RAW >	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW DET'N LIMIT = 0.05	DIST. SYSTEM YOUNG ST STANDING GUIDELINE = N/A
1991 JAN	BDL	BDL	BDL	BDL
1991 FEB	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL
1991 JUL	.430 <T	.070 <T	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	.060 <T	.060 <T
1992 DEC	BDL	BDL	BDL	BDL

ALUMINUM (UG/L)

	TREATMENT PLANT RAW >	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW DET'N LIMIT = 0.10	DIST. SYSTEM YOUNG ST STANDING GUIDELINE = 100 (A4)
1991 JAN	260.000	76.000	86.000	67.000
1991 FEB	220.000	51.000	78.000	56.000
1991 MAR	200.000	95.000	73.000	52.000
1991 APR	620.000 RRV	44.000	56.000	52.000
1991 MAY	130.000	110.000	99.000	93.000
1991 JUN	230.000	65.000	70.000	69.000
1991 JUL	110.000	170.000	120.000	120.000
1991 AUG	120.000	88.000	81.000	75.000
1991 SEP	150.000	98.000	160.000	140.000
1991 OCT	340.000	65.000	65.000	54.000
1991 NOV	150.000	57.000	68.000	68.000
1992 FEB	41.000	57.000	67.000	56.000
1992 APR	600.000	61.000	62.000	48.000
1992 JUN	21.000	61.000	59.000	55.000
1992 AUG	30.000	58.000	58.000	47.000
1992 OCT	290.000	54.000	80.000	59.000
1992 DEC	330.000	74.000	130.000	120.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
ARSENIC (UG/L) METALS)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
1991 JAN	.340 <T	BDL		BDL
1991 FEB	.410 <T	BDL		BDL
1991 MAR	.710 <T	.220 <T		.330 <T
1991 APR	1.300	BDL	.130 <T	BDL
1991 MAY	.530 <T	.240 <T	.250 <T	.140 <T
1991 JUN	.950 <T	.290 <T	.450 <T	.500 <T
1991 JUL	1.000 <T	BDL	.270 <T	.370 <T
1991 AUG	1.100	.320 <T	.540 <T	.450 <T
1991 SEP	.910 <T	.110 <T	BDL	.110 <T
1991 OCT	.880 <T	.150 <T	.220 <T	.350 <T
1991 NOV	.780 <T	.310 <T	.200 <T	.260 <T
1992 FEB	.530 <T	.450 <T	.300 <T	.500 <T
1992 APR	.450 <T	BDL	BDL	BDL
1992 JUN	.370 <T	.110 <T	.270 <T	.420 <T
1992 AUG	.780 <T	.270 <T	.590 <T	.460 <T
1992 OCT	1.100	.480 <T	.710 <T	.530 <T
1992 DEC	.670 <T	.130 <T	.190 <T	.180 <T
BARIUM (UG/L))			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
1991 JAN	34.000	28.000	27.000	27.000
1991 FEB	32.000	22.000	25.000	24.000
1991 MAR	18.000	16.000	17.000	17.000
1991 APR	36.000	22.000	22.000	22.000
1991 MAY	20.000	17.000	20.000	18.000
1991 JUN	28.000	28.000	28.000	28.000
1991 JUL	13.000	16.000	18.000	18.000
1991 AUG	24.000	23.000	21.000	22.000
1991 SEP	24.000	23.000	23.000	23.000
1991 OCT	32.000	30.000	40.000	38.000
1991 NOV	23.000	23.000	22.000	23.000
1992 FEB	34.000	30.000	31.000	33.000
1992 APR	23.000	19.000	15.000	15.000
1992 JUN	13.000	14.000	15.000	14.000
1992 AUG	18.000	20.000	23.000	22.000
1992 OCT	35.000	23.000	25.000	26.000
1992 DEC	26.000	20.000	21.000	21.000

BORON (UG/L)   METALS

GUIDELINE = 5000 (A1)   DET'N LIMIT = 2.00

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
1991 JAN	45.000	47.000	45.000	42.000
1991 FEB	27.000	26.000	26.000	29.000
1991 MAR	17.000 <T	18.000 <T	19.000 <T	18.000 <T
1991 APR	31.000	30.000	28.000	21.000
1991 MAY	19.000 <T	21.000	26.000	24.000
1991 JUN	35.000	38.000	36.000	38.000
1991 JUL	24.000	32.000	28.000	33.000
1991 AUG	41.000	45.000	39.000	39.000
1991 SEP	49.000	44.000	43.000	43.000
1991 OCT	54.000	51.000	51.000	48.000
1991 NOV	35.000	44.000	37.000	35.000
1992 FEB	32.000	30.000	29.000	28.000
1992 APR	21.000	16.000 <T	20.000 <T	19.000 <T
1992 JUN	21.000	24.000	26.000	23.000
1992 AUG	48.000	52.000	51.000	58.000
1992 OCT	32.000	30.000	32.000	31.000
1992 DEC	23.000	23.000	29.000	28.000

BERYLLIUM (UG/L)

GUIDELINE = 6800 (D4)   DET'N LIMIT = 0.05

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
1991 JAN	BDL	BDL	BDL	BDL
1991 FEB	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL
1991 APR	.100 <T	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL
1991 JUN	.060 <T	BDL	BDL	BDL
1991 JUL	.060 <T	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL
1991 OCT	.060 <T	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL
1992 FEB	.190 <T	.140 <T	BDL	.140 <T
1992 APR	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	.060 <T	.060 <T
1992 OCT	.060 <T	BDL	BDL	BDL
1992 DEC	.100 <T	BDL	BDL	BDL

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
CADMIUM (UG/L)	METALS		DET'N LIMIT = 0.05	GUIDELINE = 5.0 (A1)
1991 JAN	BDL	BDL	BDL	BDL
1991 FEB	.060 <T	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL
1991 JUN	BDL	.060 <T	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL
1991 AUG	.060 <T	.070 <T	BDL	.060 <T
1991 SEP	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL
1992 FEB	.060 <T	BDL	.070 <T	BDL
1992 APR	BDL	BDL	BDL	BDL
1992 JUN	.060 <T	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL
COBALT (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A
1991 JAN	.210 <T	.060 <T	.120 <T	.080 <T
1991 FEB	.360 <T	.160 <T	.130 <T	.180 <T
1991 MAR	.210 <T	.150 <T	.170 <T	.060 <T
1991 APR	.870 <T	.090 <T	.140 <T	.080 <T
1991 MAY	.260 <T	.160 <T	.220 <T	.120 <T
1991 JUN	.260 <T	.130 <T	.100 <T	.050 <T
1991 JUL	.500 <T	.420 <T	.350 <T	.390 <T
1991 AUG	.220 <T	.160 <T	.090 <T	.120 <T
1991 SEP	.320 <T	.170 <T	.180 <T	.150 <T
1991 OCT	.490 <T	.080 <T	.100 <T	.080 <T
1991 NOV	.250 <T	.090 <T	.150 <T	.110 <T
1992 FEB	.270 <T	.240 <T	.750 <T	.170 <T
1992 APR	.580 <T	.230 <T	.180 <T	.180 <T
1992 JUN	.270 <T	.210 <T	.270 <T	.320 <T
1992 AUG	.290 <T	.200 <T	.260 <T	.230 <T
1992 OCT	1.300 <T	.580 <T	1.400 <T	1.600 <T
1992 DEC	.320 <T	.090 <T	.080 <T	.090 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
CHROMIUM (UG/L)	METALS		DET'N LIMIT = 0.50	GUIDELINE = 50.0 (A1)
1991 JAN	4.800 <T	4.400 <T	4.100 <T	3.200 <T
1991 FEB	2.900 <T	1.100 <T	BDL	2.000 <T
1991 MAR	2.100 <T	2.000 <T	1.900 <T	1.900 <T
1991 APR	4.400 <T	2.700 <T	2.100 <T	BDL
1991 MAY	.860 <T	1.200 <T	.830 <T	1.200 <T
1991 JUN	3.000 <T	2.500 <T	2.100 <T	2.600 <T
1991 JUL	1.300 <T	2.400 <T	BDL	2.200 <T
1991 AUG	1.900 <T	1.700 <T	1.600 <T	1.400 <T
1991 SEP	3.600 <T	3.000 <T	.710 <T	1.000 <T
1991 OCT	3.000 <T	2.400 <T	2.000 <T	2.100 <T
1991 NOV	.860 <T	2.500 <T	.930 <T	.580 <T
1992 FEB	BDL	1.200 <T	BDL	BDL
1992 APR	1.900 <T	BDL	1.100 <T	.530 <T
1992 JUN	BDL	BDL	BDL	BDL
1992 AUG	2.600 <T	2.400 <T	1.900 <T	2.500 <T
1992 OCT	2.100 <T	3.100 <T	.550 <T	.980 <T
1992 DEC	3.500 <T	3.200 <T	4.400 <T	3.900 <T
COPPER (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)
1991 JAN	2.200 <T	1.500 <T	2.900 <T	8.900
1991 FEB	14.000	.910 <T	2.600 <T	13.000
1991 MAR	24.000	.800 <T	2.300 <T	14.000
1991 APR	5.700	1.000 <T	3.100 <T	13.000
1991 MAY	13.000	.570 <T	3.300 <T	13.000
1991 JUN	14.000	.840 <T	2.700 <T	12.000
1991 JUL	6.400	.630 <T	3.500 <T	3.700 <T
1991 AUG	6.700	.670 <T	2.500 <T	10.000
1991 SEP	17.000	BDL	2.200 <T	19.000
1991 OCT	12.000	.970 <T	2.800 <T	11.000
1991 NOV	16.000	1.100 <T	2.000 <T	3.100 <T
1992 FEB	15.000	2.800 <T	2.900 <T	9.200
1992 APR	1.900 <T	.540 <T	1.800 <T	8.500
1992 JUN	11.000	BDL	3.400 <T	13.000
1992 AUG	8.400	.540 <T	2.400 <T	12.000
1992 OCT	19.000	.630 <T	2.600 <T	19.000
1992 DEC	1.700 <T	.620 <T	1.600 <T	2.700 <T

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
IRON (UG/L)	>		DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)
1991 JAN	280.000	6.100 <T	26.000 <T	18.000 <T
1991 FEB	370.000	BDL	26.000 <T	17.000 <T
1991 MAR	320.000	24.000 <T	27.000 <T	19.000 <T
1991 APR	1300.000 RRV	BDL	17.000 <T	18.000 <T
1991 MAY	170.000	BDL	130.000	22.000 <T
1991 JUN	310.000	BDL	17.000 <T	30.000 <T
1991 JUL	150.000	BDL	18.000 <T	19.000 <T
1991 AUG	200.000	6.800 <T	16.000 <T	12.000 <T
1991 SEP	210.000	BDL	32.000 <T	26.000 <T
1991 OCT	690.000	BDL	24.000 <T	22.000 <T
1991 NOV	320.000	BDL	29.000 <T	29.000 <T
1992 FEB	110.000	93.000	17.000 <T	13.000 <T
1992 APR	500.000 <T	9.800 <T	33.000 <T	20.000 <T
1992 JUN	57.000 <T	BDL	25.000 <T	30.000 <T
1992 AUG	91.000	BDL	35.000 <T	17.000 <T
1992 OCT	580.000	95.000	160.000	160.000
1992 DEC	450.000	BDL	38.000 <T	37.000 <T
MERCURY (UG/L)	>		DET'N LIMIT = 0.02	GUIDELINE = 1.0 (A1)
34 SAMPLES	BDL	BDL		
MANGANESE (UG/L)	>		DET'N LIMIT = 0.05	GUIDELINE = 50.0 (A3)
1991 JAN	25.000	2.400	3.800	3.100
1991 FEB	29.000	.490 <T	2.800	2.100
1991 MAR	11.000	.660	2.100	1.200
1991 APR	83.000 RRV	.410 <T	1.700	1.500
1991 MAY	12.000	.210 <T	4.000	1.300
1991 JUN	18.000	.300 <T	1.700	2.700
1991 JUL	12.000	.280 <T	1.900	2.000
1991 AUG	14.000	.260 <T	2.400	1.100
1991 SEP	15.000	.300 <T	2.900	2.600
1991 OCT	34.000	.480 <T	2.100	1.900
1991 NOV	15.000	.410 <T	2.000	2.000
1992 FEB	30.000	7.900	7.300	4.600
1992 APR	30.000	.510	1.900	.890
1992 JUN	28.000	.340 <T	1.700	1.200
1992 AUG	44.000	.320 <T	5.000	2.500
1992 OCT	33.000	.570	1.800	1.100
1992 DEC	15.000	.820	2.500	2.400

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
MOLYBDENUM (UG/L)	METALS)		DET'N LIMIT = 0.05	GUIDELINE = N/A
1991 JAN	.990	1.800	1.800	1.800
1991 FEB	.730	1.200	1.200	1.100
1991 MAR	.500 <T	.730	.760	.760
1991 APR	.330 <T	1.300	1.200	1.200
1991 MAY	.810	.970	1.100	1.200
1991 JUN	1.500	2.000	2.100	2.100
1991 JUL	1.000	1.200	1.300	1.400
1991 AUG	1.500	1.900	1.500	1.500
1991 SEP	1.800	1.600	1.700	1.600
1991 OCT	1.400	2.300	2.300	2.100
1991 NOV	1.100	1.600	1.600	1.500
1992 FEB	.700	.860	.990	1.000
1992 APR	.500 <T	1.100	1.100	1.100
1992 JUN	2.400	2.400	2.500	2.600
1992 AUG	3.800	3.600	3.600	3.500
1992 OCT	.460 <T	.880	.930	1.200
1992 DEC	.360 <T	.890	1.000	1.000

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
NICKEL (UG/L)	)		DET'N LIMIT = 0.20	GUIDELINE = 350 (O3)
1991 JAN	1.700 <T	1.800 <T	1.800 <T	2.200
1991 FEB	1.900 <T	1.600 <T	2.700	1.700 <T
1991 MAR	.900 <T	.320 <T	BDL	.350 <T
1991 APR	2.500 <T	.590 <T	1.100 <T	1.400 <T
1991 MAY	BDL	BDL	5.300	BDL
1991 JUN	1.400 <T	.850 <T	1.300 <T	1.200 <T
1991 JUL	2.300 <T	2.100	2.400	2.400
1991 AUG	.970 <T	.660 <T	BDL	.350 <T
1991 SEP	.470 <T	BDL	BDL	1.500 <T
1991 OCT	2.800 <T	1.600 <T	1.300 <T	1.200 <T
1991 NOV	1.000 <T	.630 <T	.700 <T	1.300 <T
1992 FEB	3.700	3.200	2.700	2.700
1992 APR	2.400	1.300 <T	1.700 <T	1.400 <T
1992 JUN	1.900 <T	1.100 <T	1.900 <T	1.700 <T
1992 AUG	1.500 <T	.990 <T	1.400 <T	1.600 <T
1992 OCT	4.400 <T	1.800 <T	7.500	6.400
1992 DEC	2.400	1.400 <T	2.100	1.700 <T

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
LEAD (UG/L)	METALS		DET'N LIMIT = 0.05	GUIDELINE = 10 (A1)
1991 JAN	.420 <T	BDL	.230 <T	.500 <T
1991 FEB	.920	.160 <T	.200 <T	.460 <T
1991 MAR	1.200	BDL	.160 <T	.370 <T
1991 APR	2.800	BDL	.310 <T	.420 <T
1991 MAY	.950	BDL	.330 <T	.490 <T
1991 JUN	1.100	.060 <T	.420 <T	.980
1991 JUL	.470 <T	BDL	.540	.550
1991 AUG	.590	.340 <T	.450 <T	.770
1991 SEP	.850	.160 <T	.370 <T	5.300
1991 OCT	.950	.070 <T	.390 <T	.660
1991 NOV	.590	BDL	.220 <T	.580
1992 FEB	1.500	.070 <T	.410 <T	.580
1992 APR	.750	BDL	.580	2.500
1992 JUN	.520	BDL	.720	1.700
1992 AUG	.540	BDL	.400	1.400
1992 OCT	.790	BDL	.290 <T	.800 <T
1992 DEC	1.700	BDL	.210 <T	.400 <T

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
ANTIMONY (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)
1991 JAN	.310 <T	.610	.450 <T	.480 <T
1991 FEB	.360 <T	.500 <T	.440 <T	.480 <T
1991 MAR	.480 <T	.480 <T	.450 <T	.470 <T
1991 APR	.270 <T	.500 <T	.520	.470 <T
1991 MAY	.370 <T	.500 <T	.470 <T	.430 <T
1991 JUN	.590	.660	.570	.680
1991 JUL	.770	.640	.530	.620
1991 AUG	.520	.650	.690	.790
1991 SEP	.460 <T	.490 <T	.480 <T	.570
1991 OCT	.410 <T	.360 <T	.590	.550
1991 NOV	.400 <T	.500 <T	.450 <T	.520
1992 FEB	.380 <T	.320 <T	.180 <T	.210 <T
1992 APR	.310 <T	.420 <T	.520	.490 <T
1992 JUN	.430 <T	.320 <T	.340 <T	.330 <T
1992 AUG	.390 <T	.330 <T	.470 <T	.520
1992 OCT	.360 <T	.430 <T	.540	.540
1992 DEC	.310 <T	.480 <T	.390 <T	.420 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
SELENIUM (UG/L)	METALS)		DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
			DET'N LIMIT = 1.00	
1991 JAN	BDL	1.600 <T	1.600 <T	1.600 <T
1991 FEB	BDL	BDL	1.500 <T	1.200 <T
1991 MAR	BDL	2.200 <T	2.200 <T	2.000 <T
1991 APR	1.100 <T	2.100 <T	2.100 <T	1.500 <T
1991 MAY	BDL	BDL	BDL	BDL
1991 JUN	BDL	1.200 <T	1.800 <T	2.000 <T
1991 JUL	BDL	1.700 <T	BDL	2.700 <T
1991 AUG	BDL	BDL	BDL	1.100 <T
1991 SEP	BDL	1.500 <T	1.800 <T	2.900 <T
1991 OCT	BDL	1.400 <T	2.100 <T	1.200 <T
1991 NOV	BDL	BDL	1.700 <T	BDL
1992 FEB	BDL	1.200 <T	1.500 <T	1.400 <T
1992 APR	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	1.400 <T	1.100 <T
1992 OCT	1.300 <T	1.900 <T	3.300 <T	2.200 <T
1992 DEC	BDL	BDL	BDL	BDL

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
STRONTIUM (UG/L)	)		DET'N LIMIT = 0.10	GUIDELINE = N/A
1991 JAN	380.000	370.000	340.000	330.000
1991 FEB	360.000	250.000	300.000	290.000
1991 MAR	130.000	140.000	150.000	140.000
1991 APR	230.000	200.000	210.000	200.000
1991 MAY	160.000	160.000	190.000	190.000
1991 JUN	280.000	300.000	290.000	290.000
1991 JUL	140.000	150.000	170.000	160.000
1991 AUG	270.000	260.000	230.000	250.000
1991 SEP	280.000	250.000	270.000	270.000
1991 OCT	400.000	370.000	350.000	330.000
1991 NOV	420.000	450.000	450.000	460.000
1992 FEB	420.000	390.000	410.000	400.000
1992 APR	180.000	160.000	140.000	140.000
1992 JUN	130.000	130.000	160.000	150.000
1992 AUG	200.000	210.000	260.000	240.000
1992 OCT	360.000	240.000	280.000	270.000
1992 DEC	180.000	190.000	220.000	230.000

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
TITANIUM (UG/L)	METALS >			
			DET'N LIMIT = 0.50	GUIDELINE = N/A
1991 JAN	14.000	16.000	17.000	16.000
1991 FEB	15.000	18.000	17.000	16.000
1991 MAR	7.800	13.000	16.000	16.000
1991 APR	18.000	9.400	8.600	8.500
1991 MAY	3.600 <T	2.000 <T	2.400 <T	2.200 <T
1991 JUN	5.300	6.600	5.600	5.300
1991 JUL	6.000	9.300	8.600	9.000
1991 AUG	3.700 <T	7.000	4.600 <T	4.800 <T
1991 SEP	3.700 <T	9.300	6.900	7.000
1991 OCT	5.400	9.100	10.000	9.500
1991 NOV	4.600 <T	12.000	11.000	11.000
1992 FEB	2.900 <T	2.900 <T	3.800 <T	3.600 <T
1992 APR	11.000	18.000	15.000	15.000
1992 JUN	5.800	24.000	20.000	20.000
1992 AUG	8.100	17.000	17.000	17.000
1992 OCT	23.000	33.000	35.000	35.000
1992 DEC	3.100 <T	14.000	12.000	12.000
THALLIUM (UG/L)	>			GUIDELINE = 13 (D4)
68 SAMPLES	BDL	BDL	BDL	BDL
URANIUM (UG/L)	>		DET'N LIMIT = 0.05	DET'N LIMIT = 0.05 GUIDELINE = 100 (A1)
			DET'N LIMIT = 0.05	
1991 JAN	2.200	1.600	1.300	1.300
1991 FEB	1.300	.300 <T	.540	.480 <T
1991 MAR	.670	.110 <T	.100 <T	.100 <T
1991 APR	1.800	.430 <T	.370 <T	.340 <T
1991 MAY	.520	.200 <T	.290 <T	.250 <T
1991 JUN	.880	.350 <T	.330 <T	.370 <T
1991 JUL	.360 <T	.120 <T	.150 <T	.130 <T
1991 AUG	.420 <T	.080 <T	.150 <T	.100 <T
1991 SEP	.400 <T	BDL	.090 <T	.090 <T
1991 OCT	.510	BDL	BDL	BDL
1991 NOV	.510	BDL	BDL	.130 <T
1992 FEB	.770	.150 <T	.130 <T	.340 <T
1992 APR	.680 <T	.410 <T	.350 <T	.130 <T
1992 JUN	.350 <T	.130 <T	.170 <T	.160 <T
1992 AUG	.340 <T	.120 <T	.150 <T	.340 <T
1992 OCT	1.300	.180 <T	.320 <T	.390 <T
1992 DEC	.880	.240 <T	.400 <T	.360 <T
		.170 <T	.330 <T	

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
VANADIUM (UG/L)	METALS >		DET'N LIMIT = 0.05	GUIDELINE = N/A
1991 JAN	.740	.230 <T	.290 <T	.230 <T
1991 FEB	.800	.180 <T	.320 <T	.300 <T
1991 MAR	.610	.130 <T	.140 <T	.110 <T
1991 APR	2.300	.260 <T	.340 <T	.300 <T
1991 MAY	.610	.290 <T	.430 <T	.410 <T
1991 JUN	1.000	.440 <T	.530	.560
1991 JUL	1.500	.790	.630	.670
1991 AUG	.660	.250 <T	.530	.460 <T
1991 SEP	.740	.250 <T	.320 <T	.370 <T
1991 OCT	1.200	.110 <T	.140 <T	.090 <T
1991 NOV	.470 <T	BDL	BDL	BDL
1992 FEB	.330 <T	.230 <T	.070 <T	.230 <T
1992 APR	.910	BDL	BDL	BDL
1992 JUN	.150 <T	.110 <T	BDL	.120 <T
1992 AUG	.340 <T	.280 <T	.350 <T	.410 <T
1992 OCT	1.100	.110 <T	.450 <T	.610 <T
1992 DEC	1.000	.280 <T	.370 <T	.390 <T
ZINC (UG/L)	>		DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
1991 JAN	5.700	2.500	4.000	9.100
1991 FEB	9.200	2.800	5.400	13.000
1991 MAR	8.800	2.700	4.500	12.000
1991 APR	12.000	2.000 <T	5.500	7.800
1991 MAY	4.200	.330 <T	3.000	5.900
1991 JUN	6.300	2.600	3.800	11.000
1991 JUL	3.900	2.900	6.400	10.000
1991 AUG	3.600	1.900 <T	4.300	10.000
1991 SEP	5.100	.690 <T	2.400	150.000
1991 OCT	5.000	1.100 <T	3.500	13.000
1991 NOV	5.400	1.600 <T	3.700	10.000
1992 FEB	4.500	2.300	4.500	11.000
1992 APR	2.900	.740 <T	3.200	11.000
1992 JUN	2.900	1.200 <T	4.600	11.000
1992 AUG	3.600	2.300	5.400	14.000
1992 OCT	6.200	.890 <T	2.400	4.300
1992 DEC	5.500	2.300	3.800	8.900

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
CHLOROAROMATICS					
HEXACHLOROBUTADIENE (NG/L) >	BDL	.	DET'N LIMIT = 1.000	.	GUIDELINE = 450 (D4)
38 SAMPLES	BDL	BDL	BDL		
123-TRICHLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 5.000	.	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL		
1234-TETCLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 1.000	.	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL		
1235-TETCLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 1.000	.	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL		
124-TRICHLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 5.000	.	GUIDELINE = 10000 (1)
38 SAMPLES	BDL	BDL	BDL		
1245-TETCLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 1.000	.	GUIDELINE = 38000 (D4)
1991 JAN	BDL	BDL	BDL		
1991 FEB	IQU	BDL	BDL		
1991 MAR	BDL	11.000	BDL		
1991 APR	BDL	IQU	BDL		
1991 MAY	IQU	BDL	IQU		
1991 JUN	BDL	BDL	BDL		
1991 JUL	IAW	IAW	IAW		
1991 AUG	IAW	IAW	IAW		
1991 SEP	IAW	IAW	IAW		
1991 OCT	BDL	BDL	BDL		
1991 NOV	BDL	BDL	BDL		
1992 FEB	BDL	BDL	BDL		
1992 APR	BDL	BDL	BDL		
1992 JUN	BDL	BDL	BDL		
1992 AUG	BDL	BDL	BDL		
1992 OCT	BDL	BDL	BDL		
1992 DEC	BDL	BDL	BDL		
135-TRICHLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 5.000	.	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL		
HEXACHLOROBENZENE (NG/L) >	BDL	.	DET'N LIMIT = 1.000	.	GUIDELINE = 10 (C1)
38 SAMPLES	BDL	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
CHLOROAROMATICS				
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 1900 (D4)
1991 JAN	BDL	5.000 <T	5.000 <T	·
1991 FEB	IQU	9.000 <T	BDL	·
1991 MAR	BDL	BDL	BDL	·
1991 APR	BDL	3.000 <T	2.000 <T	·
1991 MAY	IQU	IQU	IQU	·
1991 JUN	BDL	BDL	BDL	·
1991 JUL	IAW	IAW	IAW	·
1991 AUG	IAW	IAW	IAW	·
1991 SEP	IAW	IAW	IAW	·
1991 OCT	BDL	BDL	BDL	·
1991 NOV	BDL	BDL	BDL	·
1992 FEB	BDL	4.000 <T	2.000 <T	·
1992 APR	BDL	BDL	4.000 <T	·
1992 JUN	BDL	BDL	1.000 <T	·
1992 AUG	BDL	BDL	6.000 <T	·
1992 OCT	BDL	1.000 <T	3.000 <T	·
1992 DEC	BDL	BDL	BDL	·
OCTACHLOROSTYRENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL	·
PENTACHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 74000 (D4)
38 SAMPLES	BDL	BDL	BDL	·
236-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL	·
245-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL	·
26A-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = N/A
38 SAMPLES	BDL	BDL	BDL	·

TABLE 4
ORINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST. FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
CHLOROPHENOLS					
234-TRICHLOROPHENOL (NG/L)			DET'N LIMIT = 100.0		GUIDELINE = N/A
8 SAMPLES	BDL	BDL		.	
2345-TETCHLOROPHENOL (NG/L)		BDL	DET'N LIMIT = 20.0	.	GUIDELINE = N/A
8 SAMPLES	. BDL			.	
2356-TETCHLOROPHENOL (NG/L)		BDL	DET'N LIMIT = 10.0	.	GUIDELINE = N/A
8 SAMPLES	BDL			.	
245-TRICHLOROPHENOL (NG/L)		BDL	DET'N LIMIT = 100.0	.	GUIDELINE = 2600000 (D4)
8 SAMPLES	BDL			.	
246-TRICHLOROPHENOL (NG/L)			DET'N LIMIT = 20.0	.	GUIDELINE = 5000 (A1)
1991 MAY	BDL	BDL		.	
1991 NOV	BDL	BDL		.	
1992 JUN	BDL	BDL		.	
1992 OCT	70.000 <T	BDL		.	
PENTACHLOROPHENOL (NG/L)			DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)
8 SAMPLES	BDL	BDL		.	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
PESTICIDES AND PCB				
ALDRIN (NG/L))	BDL	BDL	BDL	GUIDELINE = 700 (A1)
38 SAMPLES			DET'N LIMIT = 1.000	

ALPHA BHC (NG/L))			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
1991 JAN	1.000 <T	1.000 <T	BDL	
1991 FEB	!QU	BDL	BDL	
1991 MAR	BDL	2.000 <T	1.000 <T	
1991 APR	1.000 <T	BDL	BDL	
1991 MAY	!QU	!QU	!QU	
1991 JUN	BDL	BDL	BDL	
1991 JUL	!AW	!AW	!AW	
1991 AUG	!AW	!AW	!AW	
1991 SEP	!AW	!AW	!AW	
1991 OCT	BDL	BDL	BDL	
1991 NOV	1.000 <T	BDL	BDL	
1992 FEB	BDL	BDL	BDL	
1992 APR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 AUG	BDL	BDL	BDL	
1992 OCT	BDL	1.000 <T	BDL	
1992 DEC	1.000 <T	1.000 <T	1.000 <T	

BETA BHC (NG/L))			DET'N LIMIT = 1.00	GUIDELINE = 300 (G)
1991 JAN	BDL	2.000 <T	BDL	
1991 FEB	!QU	BDL	BDL	
1991 MAR	BDL	BDL	BDL	
1991 APR	BDL	BDL	BDL	
1991 MAY	!QU	!QU	!QU	
1991 JUN	BDL	BDL	BDL	
1991 JUL	!AW	!AW	!AW	
1991 AUG	!AW	!AW	!AW	
1991 SEP	!AW	!AW	!AW	
1991 OCT	BDL	BDL	BDL	
1991 NOV	BDL	BDL	BDL	
1992 FEB	BDL	BDL	BDL	
1992 APR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 AUG	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

PESTICIDES AND PCB

LINDANE (GAMMA BHC) (NG/L) DET'N LIMIT = 1.000 GUIDELINE = 4000 (A1)

	RAW	TREATED	FREE FLOW
1991 JAN	2.000 <T	1.000 <T	1.000 <T
1991 FEB	IQU	BDL	BDL
1991 MAR	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL
1991 MAY	IQU	IQU	IQU
1991 JUN	2.000 <T	BDL	BDL
1991 JUL	IAW	IAW	IAW
1991 AUG	IAW	IAW	IAW
1991 SEP	IAW	IAW	IAW
1991 OCT	4.000 <T	BDL	BDL
1991 NOV	1.000 <T	BDL	BDL
1992 FEB	1.000 <T	BDL	BDL
1992 APR	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL

ALPHA CHLORDANE (NG/L) DET'N LIMIT = 2.000 GUIDELINE = 7000 (A1)

	BDL	BDL	BDL

38 SAMPLES

GAMMA CHLORDANE (NG/L) DET'N LIMIT = 2.00 GUIDELINE = 7000 (A1)

	BDL	BDL	BDL

38 SAMPLES

DIELDRIN (NG/L) DET'N LIMIT = 2.00 GUIDELINE = 700 (A1)

	BDL	BDL	BDL

38 SAMPLES

METHOXYCHLOR (NG/L) DET'N LIMIT = 5.0 GUIDELINE = 900000 (A1)

	BDL	BDL	BDL

38 SAMPLES

ENDOSULFAN 1 (NG/L) DET'N LIMIT = 2.00 GUIDELINE = 74000 (D4)

	BDL	BDL	BDL

38 SAMPLES

ENDOSULFAN II (NG/L) DET'N LIMIT = 5.000 GUIDELINE = 74000 (D4)

	BDL	BDL	BDL

38 SAMPLES

ENDRIN (NG/L) DET'N LIMIT = 5.000 GUIDELINE = 1600 (D3)

	BDL	BDL	BDL

38 SAMPLES

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
PESTICIDES AND PCB				
ENDOSULFAN SULPHATE (NG/L)	BDL		DET'N LIMIT = 5.00	GUIDELINE = N/A
38 SAMPLES		BDL	BDL	
HEPTACHLOR EPOXIDE (NG/L)	BDL		DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)
26 SAMPLES		BDL	BDL	
HEPTACHLOR (NG/L)	BDL		DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)
38 SAMPLES		BDL	BDL	
MIREX (NG/L)	BDL		DET'N LIMIT = 5.000	GUIDELINE = N/A
38 SAMPLES		BDL	BDL	
OXYCHLORDANE (NG/L)	BDL		DET'N LIMIT = 2.000	GUIDELINE = N/A
38 SAMPLES		BDL	BDL	
O,P-DDT (NG/L)	BDL		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
38 SAMPLES		BDL	BDL	
PCB (NG/L)	BDL		DET'N LIMIT = 20.00	GUIDELINE = 3000 (A2)
38 SAMPLES		BDL	BDL	
P,P-DDD (NG/L)	BDL		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
38 SAMPLES		BDL	BDL	
P,P-DDE (NG/L)	BDL		DET'N LIMIT = 1.000	GUIDELINE = 30000 (A1)
38 SAMPLES		BDL	BDL	
P,P-DDT (NG/L)	BDL		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
38 SAMPLES		BDL	BDL	
TOXAPHENE (NG/L)	BDL		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)
33 SAMPLES		BDL	BDL	
AMETRINE (NG/L)	BDL		DET'N LIMIT = 50.0	GUIDELINE = 300000 (D3)
30 SAMPLES		BDL		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
	PESTICIDES AND PCB			

ATRAZINE (NG/L)

GUIDELINE = 60000 (A2)

	RAW	TREATED	FREE FLOW	STANDING
	)		DET'N LIMIT = 50.0	
1991 JAN	350.000 <T	270.000 <T	.	.
1991 FEB	BDL	BDL	.	.
1991 MAR	BDL	220.000 <T	.	.
1991 APR	170.000 <T	BDL	.	.
1991 MAY	BDL	BDL	.	.
1991 JUN	1302.000	357.000 <T	.	.
1991 JUL	!AW	!AW		.
1991 AUG	!AW	!AW		.
1991 SEP	260.000 <T	BDL	.	.
1991 OCT	230.000 <T	BDL	.	.
1991 NOV	160.000 <T	110.000 <T	.	.
1992 FEB	100.000 <T	120.000 <T	.	.
1992 APR	190.000 <T	70.000 <T	.	.
1992 JUN	100.000 <T	BDL	.	.
1992 AUG	300.000 <T	BDL	.	.
1992 OCT	340.000 <T	80.000 <T	.	.
1992 DEC	160.000 <T	70.000 <T	.	.

ATRATONE (NG/L)

GUIDELINE = N/A

	RAW	TREATED	FREE FLOW	STANDING
	)		DET'N LIMIT = 50.0	.
30 SAMPLES	BDL	BDL		.

CYANAZINE (BLADEX) (NG/L)

GUIDELINE = 10000 (A2)

	RAW	TREATED	FREE FLOW	STANDING
	)		DET'N LIMIT = 100.0	
1991 JAN	BDL	BDL	.	.
1991 FEB	BDL	BDL	.	.
1991 MAR	BDL	BDL	.	.
1991 APR	BDL	BDL	.	.
1991 MAY	BDL	BDL	.	.
1991 JUN	374.000 <T	BDL	.	.
1991 JUL	!AW	!AW		.
1991 AUG	BDL	BDL	.	.
1991 SEP	BDL	BDL	.	.
1991 OCT	BDL	BDL	.	.
1991 NOV	BDL	BDL	.	.
1992 FEB	BDL	BDL	.	.
1992 APR	BDL	BDL	.	.
1992 JUN	BDL	BDL	.	.
1992 AUG	BDL	BDL	.	.
1992 OCT	BDL	BDL	.	.
1992 DEC	BDL	BDL	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

PESTICIDES AND PCB

DESETHYL ATRAZINE (NG/L)

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
1991 JAN	230.000 <T	BDL	.	.
1991 FEB	BDL	BDL	.	.
1991 MAR	BDL	BDL	.	.
1991 APR	BDL	BDL	.	.
1991 MAY	BDL	BDL	.	.
1991 JUN	305.000 <T	BDL	.	.
1991 JUL		IAW	.	.
1991 AUG		IAW	.	.
1991 SEP		BDL	.	.
1991 OCT		BDL	.	.
1991 NOV		BDL	.	.
1992 FEB		BDL	.	.
1992 APR		BDL	.	.
1992 JUN		BDL	.	.
1992 AUG	200.000 <T	BDL	.	.
1992 OCT	290.000 <T	BDL	.	.
1992 DEC	BDL	BDL	.	.

DET'N LIMIT = 200.0   GUIDELINE = 60000 (A2)

DESETHYL SIMAZINE (NG/L)
| | > | BDL | DET'N LIMIT = 200.0 | GUIDELINE = 10000 (A2) |
30 SAMPLES   BDL

PROMETONE (NG/L)
| | > | BDL | DET'N LIMIT = 50.000 | GUIDELINE = 52500 (D3) |
30 SAMPLES   BDL

PROPAZINE (NG/L)
| | > | BDL | DET'N LIMIT = 50.000 | GUIDELINE = 700000 (D3) |
30 SAMPLES   BDL

PROMETRYNE (NG/L)
| | > | BDL | DET'N LIMIT = 50.000 | GUIDELINE = 1000 (A2) |
30 SAMPLES   BDL

METRIBUZIN (SENCOR) (NG/L)
| | > | BDL | DET'N LIMIT = 100.0 | GUIDELINE = 80000 (A1) |
30 SAMPLES   BDL

SIMAZINE (NG/L)
| | -) | BDL | DET'N LIMIT = 50.00 | GUIDELINE = 10000 (A2) |
30 SAMPLES   BDL

ALACHLOR (LASSO) (NG/L)
| | > | BDL | DET'N LIMIT = 500.0 | GUIDELINE = 5000 (A2) |
30 SAMPLES   BDL

PESTICIDES AND PCB

METOLACHLOR (NG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)
1991 JAN	BDL	BDL	.	.
1991 FEB	BDL	BDL	.	.
1991 MAR	BDL	BDL	.	.
1991 APR	BDL	BDL	.	.
1991 MAY	BDL	BDL	.	.
1991 JUN	1755.000 <T	823.000 <T	.	.
1991 JUL	IAW	IAW	.	.
1991 AUG	IAW	IAW	.	.
1991 SEP	BDL	BDL	.	.
1991 OCT	BDL	BDL	.	.
1991 NOV	BDL	BDL	.	.
1991 DEC	BDL	BDL	.	.
1992 FEB	BDL	BDL	.	.
1992 APR	BDL	BDL	.	.
1992 JUN	BDL	BDL	.	.
1992 AUG	BDL	BDL	.	.
1992 OCT	BDL	BDL	.	.
1992 DEC	BDL	BDL	.	.

HEXACLCYCLOPENTADIEN (NG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = 5.00	GUIDELINE = 206000 (O4)
1991 JAN	BDL	BDL	BDL	.
1991 FEB	IQU	19.000 <T	23.000 <T	.
1991 MAR	BDL	37.000 <T	30.000 <T	.
1991 APR	BDL	79.000	51.000	.
1991 MAY	IQU	IQU	IQU	.
1991 JUN	BDL	60.000	49.000 <T	.
1991 JUL	IAW	IAW	IAW	.
1991 AUG	IAW	IAW	IAW	.
1991 SEP	IAW	IAW	IAW	.
1991 OCT	BDL	12.000 <T	14.000 <T	.
1991 NOV	BDL	BDL	25.000 <T	.
1992 FEB	IQU	IQU	112.000	.
1992 APR	IQU	IQU	IQU	.
1992 JUN	IQU	IQU	IQU	.
1992 AUG	IQU	IQU	IQU	.
1992 OCT	IQU	IQU	IQU	.
1992 DEC	IQU	IQU	IQU	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

PHENOLICS (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
			DET'N LIMIT = 0.2	GUIDELINE = N/A
1991 JAN	.600 <T	1.600	.	.
1991 FEB	BDL	3.000	.	.
1991 MAR	BDL	BDL	.	.
1991 APR	.800 <T	BDL	.	.
1991 MAY	.400 <T	BDL	.	.
1991 JUN	.600 <T	.600 <T	.	.
1991 JUL	BDL	BDL	.	.
1991 AUG	.200 <T	.600 <T	.	.
1991 SEP	BDL	BDL	.	.
1991 OCT	.400 <T	.600 <T	.	.
1991 NOV	.600 <T	.600 <T	.	.
1992 FEB	.800 <T	.400 <T	.	.
1992 APR	1.400	1.200	.	.
1992 JUN	1.600	BDL	.	.
1992 AUG	.400 <T	BDL	.	.
1992 OCT	.400 <T	BDL	.	.
1992 DEC	BDL	1.000 <T	.	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
POLYAROMATIC HYDROCARBONS					
PHENANTHRENE (NG/L	)	BDL	DET'N LIMIT = 10.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
ANTHRACENE (NG/L	)	BDL	DET'N LIMIT = 1.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
FLUORANTHENE (NG/L	)	BDL	DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)
17 SAMPLES	BDL		BDL		
PYRENE (NG/L	)	BDL	DET'N LIMIT = 20.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
BENZO(A)ANTHRACENE (NG/L	)	BDL	DET'N LIMIT = 20.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
CHRYSENE (NG/L	)	BDL	DET'N LIMIT = 50.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
DIMETH. BENZ(A)ANTHR (NG/L	)	BDL	DET'N LIMIT = 5.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
BENZO(E) PYRENE (NG/L	)	BDL	DET'N LIMIT = 50.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
BENZO(B) FLUORANTHEN (NG/L	)	BDL	DET'N LIMIT = 10.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
PERYLENE (NG/L	)	BDL	DET'N LIMIT = 10.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
BENZO(K) FLUORANTHEN (NG/L	)	BDL	DET'N LIMIT = 1.0	.	GUIDELINE = N/A
17 SAMPLES	BDL		BDL		
BENZO(A) PYRENE (NG/L	)	BDL	DET'N LIMIT = 5.0	.	GUIDELINE = 10 (A1)
17 SAMPLES	BDL		BDL		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
POLYAROMATIC HYDROCARBONS					
BENZO(G,H,I) PERYLEN (NG/L)	BDL	BDL	DET'N LIMIT = 20.0	BDL	GUIDELINE = N/A
17 SAMPLES					
DIBENZO(A,H) ANTHRAC (NG/L)	BDL	BDL	DET'N LIMIT = 10.0	BDL	GUIDELINE = N/A
17 SAMPLES					
INDENO(1,2,3-C,D) PY (NG/L)	BDL	BDL	DET'N LIMIT = 20.0	BDL	GUIDELINE = N/A
17 SAMPLES					
BENZO(B) CHRYSENE (NG/L)	BDL	BDL	DET'N LIMIT = 2.0	BDL	GUIDELINE = N/A
17 SAMPLES					
CORONENE (NG/L)	BDL	BDL	DET'N LIMIT = 10.0	BDL	GUIDELINE = N/A
17 SAMPLES					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY W/P

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
SPECIFIC PESTICIDES					
TOXAPHENE (NG/L)	>		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)
5 SAMPLES	BDL	BDL	BDL		
2,4,5-T (NG/L	>		DET'N LIMIT = 50.0	.	GUIDELINE = 280000 (A1)
8 SAMPLES	BDL	- BDL	.		
2,4-D (NG/L	>		DET'N LIMIT = 100.0	.	GUIDELINE = 100000 (A1)
8 SAMPLES	BDL	BDL	.		
2,4-DB (NG/L	>		DET'N LIMIT = 200.0	.	GUIDELINE = N/A
8 SAMPLES	BDL	BDL	.		
2,4 D PROPIONIC ACID (NG/L	>		DET'N LIMIT = 100.0	.	GUIDELINE = N/A
8 SAMPLES	BDL	BDL	.		
DICAMBA (NG/L	>		DET'N LIMIT = 50.0	.	GUIDELINE = 120000 (A1)
8 SAMPLES	BDL	BDL	.		
2,4,5-TP (SILVEX) (NG/L	>		DET'N LIMIT = 20.00	.	GUIDELINE = 10000 (A1)
8 SAMPLES	BDL	BDL	.		
DIAZINON (NG/L	>		DET'N LIMIT = 20.0	.	GUIDELINE = 20000 (A1)
6 SAMPLES	BDL	BDL	.		
DICHLOROVOS (NG/L	>		DET'N LIMIT = 20.0	.	GUIDELINE = N/A
6 SAMPLES	BDL	BDL	.		
CHLORPYRIFOS (NG/L	>		DET'N LIMIT = 20.0	.	GUIDELINE = N/A
6 SAMPLES	BDL	BDL	.		
ETHION (NG/L	>		DET'N LIMIT = 20.0	.	GUIDELINE = 35000 (G)
6 SAMPLES	BDL	BDL	.		
MALATHION (NG/L	>		DET'N LIMIT = 20.0	.	GUIDELINE = 190000 (A1)
6 SAMPLES	BDL	BDL	.		

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
SPECIFIC PESTICIDES				
MEVINPHOS (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = N/A
6 SAMPLES		BDL		
METHYL PARATHION (NG/L	)		DET'N LIMIT = 50.0	GUIDELINE = 9000 (D3)
6 SAMPLES		BDL		
METHYLTRITHION (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = N/A
6 SAMPLES		BDL		
PARATHION (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = 50000 (A1)
6 SAMPLES		BDL		
PHORATE (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = 2000 (A2)
6 SAMPLES		BDL		
RELDAN (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = N/A
6 SAMPLES		BDL		
RONNEL (NG/L	)		DET'N LIMIT = 20.0	GUIDELINE = N/A
6 SAMPLES		BDL		
CARBOFURAN (NG/L	)		DET'N LIMIT = 2000.0	GUIDELINE = 90000 (A1)
8 SAMPLES		BDL		
CHLORPROPHAM (CIPC) (NG/L	)		DET'N LIMIT = 2000.0	GUIDELINE = 350000 (G)
8 SAMPLES		BDL		
DIALLATE (NG/L	)		DET'N LIMIT = 2000.0	GUIDELINE = N/A
8 SAMPLES		BDL		
EPTAM (NG/L	)		DET'N LIMIT = 2000.0	GUIDELINE = N/A
8 SAMPLES		BDL		
IPC (NG/L	)		DET'N LIMIT = 2000.0	GUIDELINE = N/A
8 SAMPLES		BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
SPECIFIC PESTICIDES					
PROPOXUR (NG/L)	)		DET'N LIMIT = 2000.0		GUIDELINE = 140000 (D3)
8 SAMPLES	BDL	BDL			
CARBARYL (NG/L)	)		DET'N LIMIT = 200.0		GUIDELINE = 90000 (A1)
8 SAMPLES	BDL	BDL			
BUTYLATE (NG/L)	)		DET'N LIMIT = 2000.0		GUIDELINE = 245000 (D3)
8 SAMPLES	BDL	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
BENZENE (UG/L) VOLATILES	)		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
	BDL	BDL		
51 SAMPLES				

TOLUENE (UG/L)	)	BDL	BDL DET'N LIMIT = 0.05	DET'N LIMIT = 0.05 GUIDELINE = 24 (A3)
1991 JAN	BDL	.050 <T	.300 <T	
1991 FEB	.150 <T	BDL	.050 <T	
1991 MAR	.100 <T	.150 <T	.200 <T	
1991 APR	BDL	BDL	BDL	
1991 MAY	BDL	BDL	BDL	
1991 JUN	BDL	BDL	BDL	
1991 JUL	BDL	BDL	BDL	
1991 AUG	BDL	BDL	BDL	
1991 SEP	BDL	BDL	BDL	
1991 OCT	BDL	BDL	BDL	
1991 NOV	BDL	.100 <T	BDL	
1992 FEB	BDL	BDL	BDL	
1992 APR	.050 <T	BDL	BDL	
1992 JUN	.050 <T	BDL	BDL	
1992 AUG	BDL	BDL	BDL	
1992 OCT	.150 <T	BDL	BDL	
1992 DEC	BDL	BDL	BDL	

ETHYLBENZENE (UG/L)	)		DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
1991 JAN	BDL	.100 <T	BDL	
1991 FEB	BDL	.050 <T	.050 <T	
1991 MAR	.050 <T	BDL	.100 <T	
1991 APR	BDL	BDL	.100 <T	
1991 MAY	BDL	.100 <T	BDL	
1991 JUN	BDL	.100 <T	BDL	
1991 JUL	BDL	.100 <T	.150 <T	
1991 AUG	BDL	.200 <T	BDL	
1991 SEP	BDL	.200 <T	.050 <T	
1991 OCT	BDL	.050 <T	.050 <T	
1991 NOV	BDL	BDL	.050 <T	
1992 FEB	BDL	BDL	.050 <T	
1992 APR	BDL	BDL	.100 <T	
1992 JUN	.050 <T	.100 <T	.100 <T	
1992 AUG	BDL	.150 <T	BDL	
1992 OCT	BDL	BDL	BDL	
1992 DEC	BDL	BDL	.100 <T	

P-XYLENE (UG/L)	)	BDL	BDL DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
51 SAMPLES	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
M-XYLENE (UG/L)	VOLATILES)		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
1991 JAN	BDL	BDL	BDL	.
1991 FEB	BDL	BDL	BDL	.
1991 MAR	BDL	BDL	BDL	.
1991 APR	BDL	BDL	BDL	.
1991 MAY	BDL	BDL	BDL	.
1991 JUN	BDL	BDL	BDL	.
1991 JUL	BDL	BDL	.100 <T	.
1991 AUG	BDL	BDL	BDL	.
1991 SEP	BDL	BDL	.200 <T	.
1991 OCT	BDL	BDL	BDL	.
1991 NOV	BDL	BDL	BDL	.
1992 FEB	BDL	BDL	BDL	.
1992 APR	BDL	BDL	BDL	.
1992 JUN	BDL	BDL	BDL	.
1992 AUG	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
O-XYLENE (UG/L)	)		DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)
1991 JAN	BDL	BDL	BDL	
1991 FEB	BDL	BDL	BDL	
1991 MAR	BDL	BDL	BDL	
1991 APR	BDL	BDL	BDL	
1991 MAY	BDL	BDL	BDL	
1991 JUN	BDL	BDL	BDL	
1991 JUL	BDL	BDL	.100 <T	
1991 AUG	BDL	BDL	BDL	
1991 SEP	BDL	BDL	.100 <T	
1991 OCT	BDL	BDL	BDL	
1991 NOV	BDL	BDL	BDL	
1992 FEB	BDL	BDL	BDL	
1992 APR	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 AUG	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
VOLATILES	)			
STYRENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (O1)
1991 JAN	BDL	BDL	BDL	
1991 FEB	BDL	BDL	.100 <T	
1991 MAR	.100 <T	BDL	.200 <T	
1991 APR	BDL	BDL	.150 <T	
1991 MAY	BDL	BDL	BDL	
1991 JUN	BDL	BDL	.050 <T	
1991 JUL	BDL	BDL	.200 <T	
1991 AUG	BDL	BDL	.050 <T	
1991 SEP	BDL	BDL	.050 <T	
1991 OCT	BDL	BDL	.050 <T	
1991 NOV	BDL	BDL	.100 <T	
1992 FEB	BDL	BDL	.150 <T	
1992 APR	.100 <T	BDL	.150 <T	
1992 JUN	BDL	BDL	.200 <T	
1992 AUG	BDL	BDL	.250 <T	
1992 OCT	.050 <T	BDL	BDL	
1992 DEC	BDL	BDL	.150 <T	
1,1-DICHLOROETHYLENE (UG/L)	)		DET'N LIMIT = 0.100	GUIDELINE = 7 (O1)
51 SAMPLES	BDL	BDL	BDL	
METHYLENE CHLORIDE (UG/L)	)		DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)
51 SAMPLES	BDL	BDL	BDL	
T12-DICHLOROETHYLENE (UG/L)	)		DET'N LIMIT = 0.10	GUIDELINE = 70 (O1)
51 SAMPLES	BDL	BDL	BDL	
1,1-DICHLOROETHANE (UG/L)	)		DET'N LIMIT = 0.100	GUIDELINE = N/A
51 SAMPLES	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
CHLOROFORM (UG/L) VOLATILES			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
1991 JAN	.200 <T	53.100	37.800	.
1991 FEB	BDL	34.200	28.900	.
1991 MAR	2.000	36.100	19.400	.
1991 APR	BDL	51.900	39.700	.
1991 MAY	BDL	43.600	39.200	.
1991 JUN	.	56.200	42.200	.
1991 JUL	BDL	55.500	35.500	.
1991 AUG	BDL	43.500	35.200	.
1991 SEP	BDL	33.800	25.600	.
1991 OCT	BDL	23.500	11.300	.
1991 NOV	BDL	32.400	16.300	.
1992 FEB	BDL	31.400	31.700	.
1992 APR	15.300	41.500	19.900	.
1992 JUN	BDL	15.800	10.100	.
1992 AUG	BDL	31.400	36.500	.
1992 OCT	39.500	74.200	86.200	.
1992 DEC	BDL	34.300	22.200	.
111,TRICHLOROETHANE (UG/L) >			DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)
51 SAMPLES	BDL	BDL	BDL	.
1,2 DICHLOROETHANE (UG/L) >			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
51 SAMPLES	BDL	BDL	BDL	.
CARBON TETRACHLORIDE (UG/L) >			DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)
51 SAMPLES	BDL	BDL	BDL	.
1,2-DICHLOROPROPANE (UG/L) >			DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)
51 SAMPLES	BDL	BDL	BDL	.
TRICHLOROETHYLENE (UG/L) >			DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)
51 SAMPLES	BDL	BDL	BDL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
		>	>	

DICHLOROBROMOMETHANE (UG/L)

VOLATILES

			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
1991 JAN	BDL	19.700 SPS	11.850 SPS	.
1991 FEB	BDL	15.450	11.300	.
1991 MAR	.850	12.850	7.250	.
1991 APR	BDL	20.150	13.700	.
1991 MAY	BDL	15.600	15.800	.
1991 JUN	BDL	25.200	21.300	.
1991 JUL	BDL	19.350	16.300	.
1991 AUG	BDL	22.150	20.700	.
1991 SEP	BDL	17.800	15.400	.
1991 OCT	BDL	21.600	12.000	.
1991 NOV	BDL	22.050	13.750	.
1992 FEB	BDL	16.800	13.500	.
1992 APR	4.600	12.100	7.600	.
1992 JUN	BDL	12.100	9.950	.
1992 AUG	BDL	15.600	19.300	.
1992 OCT	8.650	14.600	18.400	.
1992 DEC	BDL	16.000	10.400	.

112-TRICHLOROETHANE (UG/L)

		>	DET'N LIMIT = 0.05	GUIDELINE = 0.6 (04)
51 SAMPLES	BDL	BDL	BDL	.

CHLORODIBROMOMETHANE (UG/L)

		>	DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
1991 JAN	BDL	3.800	2.400	.
1991 FEB	BDL	4.300	3.300	.
1991 MAR	.300 <T	2.700	1.800	.
1991 APR	BDL	5.400	3.800	.
1991 MAY	BDL	4.100	4.300	.
1991 JUN	BDL	10.200	8.200	.
1991 JUL	BDL	6.400	6.200	.
1991 AUG	BDL	11.200	10.100	.
1991 SEP	BDL	8.000	8.000	.
1991 OCT	BDL	13.800	9.000	.
1991 NOV	BDL	9.600	7.600	.
1992 FEB	BDL	BDL	3.900	.
1992 APR	.500 <T	1.800	2.400	.
1992 JUN	BDL	7.200	7.300	.
1992 AUG	BDL	6.000	7.200	.
1992 OCT	.800 <T	1.600	2.400	.
1992 DEC	BDL	4.700	3.100	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

VOLATILES

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING

TETRACHLOROETHYLENE (UG/L) GUIDELINE = 65 (A5)

	RAW >	TREATED	DET'N LIMIT = 0.05	STANDING
1991 JAN	BDL	BDL	BDL	.
1991 FEB	BDL	BDL	BDL	.
1991 MAR	BDL	BDL	BDL	.
1991 APR	BDL	BDL	BDL	.
1991 MAY	BDL	.100 <T	BDL	.
1991 JUN	BDL	BDL	BDL	.
1991 JUL	BDL	BDL	BDL	.
1991 AUG	BDL	BDL	BDL	.
1991 SEP	BDL	BDL	BDL	.
1991 OCT	BDL	BDL	BDL	.
1991 NOV	BDL	BDL	BDL	.
1992 FEB	BDL	BDL	BDL	.
1992 APR	BDL	BDL	BDL	.
1992 AUG	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.

BROMOFORM (UG/L) GUIDELINE = 350 (A1+)

	RAW >	TREATED	DET'N LIMIT = 0.20	STANDING
1991 JAN	BDL	BDL	BDL	.
1991 FEB	BDL	.200 <T	.200 <T	.
1991 MAR	BDL	BDL	BDL	.
1991 APR	BDL	.200 <T	BDL	.
1991 MAY	BDL	BDL	BDL	.
1991 JUN	BDL	.800 <T	.600 <T	.
1991 JUL	BDL	BDL	BDL	.
1991 AUG	BDL	1.000 <T	.800 <T	.
1991 SEP	BDL	BDL	.800 <T	.
1991 OCT	BDL	1.800 <T	1.200 <T	.
1991 NOV	BDL	.800 <T	.600 <T	.
1992 FEB	BDL	BDL	BDL	.
1992 APR	BDL	.800 <T	.800 <T	.
1992 JUN	BDL	BDL	BDL	.
1992 AUG	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 DEC	BDL	BDL	BDL	.

1122-TETCHLOROETHANE (UG/L) GUIDELINE = 0.17 (D4)

RAW	TREATED	FREE FLOW DET'N LIMIT = 0.05	STANDING
BDL	>	BDL	.

51 SAMPLES

VINYL CHLORIDE (UG/L) GUIDELINE = 2 (O1)

RAW >	TREATED	FREE FLOW DET'N LIMIT = 0.100	STANDING
BDL	BDL	BDL	.

18 SAMPLES

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TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 TILBURY WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING	
VOLATILES					
C12-DICHLOROETHYLENE (UG/L)	BDL >		DET'N LIMIT = 0.100		GUIDELINE = 70 (D1)
18 SAMPLES		BDL	BDL		
CHLOROBENZENE (UG/L)	BDL >		DET'N LIMIT = 0.10		GUIDELINE = 1510 (D3)
51 SAMPLES	BDL	BDL	BDL		
1,4-DICHLOROBENZENE (UG/L)	BDL >		DET'N LIMIT = 0.10		GUIDELINE = 5 (A1)
51 SAMPLES	BDL	BDL	BDL		
1,3-DICHLOROBENZENE (UG/L)	BDL >		DET'N LIMIT = 0.10		GUIDELINE = 3750 (D3)
51 SAMPLES	BDL	BDL	BDL		
1,2-DICHLOROBENZENE (UG/L)	BDL >		DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)
51 SAMPLES	BDL	BDL	BDL		
ETHYLENE DIBROMIDE (UG/L)	BDL >		DET'N LIMIT = 0.05		GUIDELINE = 50 (D1)
51 SAMPLES	BDL	BDL	BDL		
TOTL TRIHALOMETHANES (UG/L)	BDL >		DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)
1991 JAN	BDL	76.600	52.050		
1991 FEB	BDL	54.250	43.650		
1991 MAR	3.150 <T	51.700	28.500		
1991 APR	BDL	77.700	57.250		
1991 MAY	BDL	63.300	59.300		
1991 JUN	BDL	92.400	72.200		
1991 JUL	BDL	81.250	58.000		
1991 AUG	BDL	77.850	66.800		
1991 SEP	BDL	59.600	49.800		
1991 OCT	BDL	60.600	33.500		
1991 NOV	BDL	64.800	38.250		
1992 FEB	BDL	48.200	49.100		
1992 APR	20.400	55.400	29.900		
1992 JUN	BDL	35.900	28.150		
1992 AUG	BDL	53.000	63.000		
1992 OCT	48.950	90.400	107.000		
1992 DEC	BDL	55.000	35.700		

RADIONUCLIDES	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM YOUNG ST FREE FLOW	DIST. SYSTEM YOUNG ST STANDING
COBALT 60 (BQ/L)	>		DET'N LIMIT = 0.70	GUIDELINE = N/A
6 SAMPLES	BDL	BDL		
CESIUM 134 (BQ/L)	>		DET'N LIMIT = 0.70	GUIDELINE = N/A
6 SAMPLES	BDL	BDL		
CESIUM 137 (BQ/L)	>		DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)
6 SAMPLES	BDL	BDL		
GROSS ALPHA COUNT (BQ/L)	>		DET'N LIMIT = 0.04	GUIDELINE = 0.55 (01)
6 SAMPLES	BDL	BDL		
GROSS BETA COUNT (BQ/L)	>		DET'N LIMIT = 0.04	GUIDELINE = N/A
1991 JUL	BDL	BDL		
1992 FEB	.110	.110		
1992 AUG	.100	.100		
TRITIUM (BQ/L)	>		DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)
1991 JUL	BDL	BDL		
1992 FEB	BDL	BDL		
1992 AUG	11.000	8.000		
IODINE 131 (BQ/L)	>		DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)
6 SAMPLES	BDL	BDL		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BACTERIOLOGICAL				
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0	(A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML	(A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A	
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML	(A1)
CHEMISTRY (FLD)				
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A	
FIELD PH	DMNSLESS	N/A	6.5-8.5	(A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0	(A3)
FIELD TURBIDITY	FTU	N/A	1.0	(A1)
CHEMISTRY (LAB)				
ALKALINITY	MG/L	0.20	30-500	(A4)
AMMONIUM TOTAL	MG/L	0.002	0.05	(F2)
CALCIUM	MG/L	0.20	100.0	(F2)
CHLORIDE	MG/L	0.20	250.0	(A3)
COLOUR	TCU	0.50	5.0	(A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0	(F2)
CYANIDE	MG/L	0.001	0.2	(A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0	(A3)
FLUORIDE	MG/L	0.01	1.5*	(A1)
HARDNESS	MG/L	0.50	80-100	(A4)
IONCAL	DMNSLESS	N/A	N/A	
LANGELIERS INDEX	DMNSLESS	N/A	N/A	
MAGNESIUM	MG/L	0.10	30.0	(F2)
NITRATES (TOTAL)	MG/L	0.005	10.0	(A1)
NITRITE	MG/L	0.001	1.0	(A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A	
PH	DMNSLESS	N/A	6.5-8.5	(A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A	
PHOSPHORUS TOTAL	MG/L	0.002	0.4	(F2)
POTASSIUM	MG/L	0.010	10.0	(F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0	(A3)
SODIUM	MG/L	0.20	200.0	(A4)
SULPHATE	MG/L	0.20	500.0	(A4)
TURBIDITY	FTU	0.05	1.0	(A1)

* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.

CHLOROAROMATICS				
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A	
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A	
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A	
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000	(I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000	(D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A	
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A	
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A	
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A	
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10	(C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450	(D4)
HEXACHLOROETHANE	NG/L	1.0	1900	(D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A	
PENTACHLOROBENZENE	NG/L	1.0	74000	(D4)

CHLOROPHENOLS				
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A	
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A	
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000	(D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000	(A1)
PENTACHLOROPHENOL	NG/L	10.0	60000	(A1)

METALS

ALUMINUM	UG/L	0.10	100	(A4)
ANTIMONY	UG/L	0.05	146	(D4)
ARSENIC	UG/L	0.10	25	(A1)
BARIUM	UG/L	0.05	1000	(A2)
BERYLLIUM	UG/L	0.05	6800	(D4)
BORON	UG/L	2.00	5000	(A1)
CADMIUM	UG/L	0.05	5	(A1)
CHROMIUM	UG/L	0.50	50	(A1)
COBALT	UG/L	0.02	N/A	
COPPER	UG/L	0.50	1000	(A3)
IRON	UG/L	6.00	300	(A3)
LEAD	UG/L	0.05	10	(A1)
MANGANESE	UG/L	0.05	50	(A3)
MERCURY	UG/L	0.02	1	(A1)
MOLYBDENUM	UG/L	0.05	N/A	
NICKEL	UG/L	0.20	350	(D3)
SELENIUM	UG/L	1.00	10	(A1)
SILVER	UG/L	0.05	N/A	
STRONTIUM	UG/L	0.10	N/A	
THALLIUM	UG/L	0.05	13	(D4)
TITANIUM	UG/L	0.50	N/A	
URANIUM	UG/L	0.05	100	(A1)
VANADIUM	UG/L	0.05	N/A	
ZINC	UG/L	0.20	5000	(A3)

POLYNUCLEAR AROMATIC HYDROCARBONS

ANTHRACENE	NG/L	1.0	N/A	
BENZO(A) ANTHRACENE	NG/L	20.0	N/A	
BENZO(A) PYRENE	NG/L	5.0	10	(A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A	
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A	
BENZO(E) PYRENE	NG/L	50.0	N/A	
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A	
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A	
CHRYSENE	NG/L	50.0	N/A	
CORONENE	NG/L	10.0	N/A	
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A	
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A	
FLUORANTHENE	NG/L	20.0	42000	(D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A	
PERYLENE	NG/L	10.0	N/A	
PHENANTHRENE	NG/L	10.0	N/A	
PYRENE	NG/L	20.0	N/A	

PESTICIDES & PCB

ALACHLOR (LASSO)	NG/L	500.0	5000	(A2)
ALDRIN	NG/L	1.0	700	(A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700	(G)
ALPHA CHLORDANE	NG/L	2.0	7000	(A1)
AMETRINE	NG/L	50.0	300000	(D3)
ATRATONE	NG/L	50.0	N/A	
ATRAZINE	NG/L	50.0	60000	(A2)
DESETHYL ATRAZINE	NG/L	200.0	60000	(A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300	(G)
CYANAZINE (BLADEX)	NG/L	100.0	10000	(A2)
DIELDRIN	NG/L	2.0	700	(A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000	(D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000	(D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
ENDRIN	NG/L	5.0	1600	(D3)
GAMMA CHLORDANE	NG/L	2.0	7000	(A1)
HEPTACHLOR	NG/L	1.0	3000	(A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000	(A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000	(D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000	(A1)
METHOXYCHLOR	NG/L	5.0	900000	(A1)
METOLACHLOR	NG/L	500.0	50000	(A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000	(A1)
MIREX	NG/L	5.0	N/A	
P,P-DDD	NG/L	5.0	30000	(A1)
O,P-DDT	NG/L	5.0	30000	(A1)
P,P-DDT	NG/L	5.0	30000	(A1)
P,P-DDE	NG/L	1.0	30000	(A1)
OXYCHLORDANE	NG/L	2.0	N/A	
PCB	NG/L	20.0	3000	(A2)
PROMETONE	NG/L	50.0	52500	(D3)
PROMETRYNE	NG/L	50.0	1000	(A2)
PROPAZINE	NG/L	50.0	700000	(D3)
SIMAZINE	NG/L	50.0	10000	(A2)
DESETHYL SIMAZINE	NG/L	200.0	10000	(A2)
TOXAPHENE	NG/L	500.0	5000	(A1)

PHENOLICS

PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A	

SPECIFIC PESTICIDES

2,4 D PROPIONIC ACID	NG/L	100.0	N/A	
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000	(A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000	(A1)
2,4-DICHLORORPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A	
2,4,5-TP (SILVEX)	NG/L	20.0	10000	(A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000	(D3)
CARBARYL (SEVIN)	NG/L	200.0	90000	(A1)
CARBOFURAN	NG/L	2000.0	90000	(A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000	(G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A	
DIALLATE	NG/L	2000.0	N/A	
DIAZINON	NG/L	20.0	20000	(A1)
DICAMBA	NG/L	50.0	120000	(A1)
DICHLOROVOS	NG/L	20.0	N/A	
EPTAM	NG/L	2000.0	N/A	
ETHION	NG/L	20.0	35000	(G)
IPC	NG/L	2000.0	N/A	
MALATHION	NG/L	20.0	190000	(A1)
METHYL PARATHION	NG/L	50.0	9000	(D3)
METHYLTRITHION	NG/L	20.0	N/A	
MEVINPHOS	NG/L	20.0	N/A	
PARATHION	NG/L	20.0	50000	(A1)
PHORATE (THIMET)	NG/L	20.0	2000	(A2)
PICHLORAM	NG/L	100.0	190000	(A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000	(D3)
RELDAN	NG/L	20.0	N/A	
RONNEL	NG/L	20.0	N/A	

VOLATILES

1,1-DICHLOROETHANE	UG/L	0.10	N/A	
1,1-DICHLOROETHYLENE	UG/L	0.10	7	(D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200	(A1)
1,2-DICHLOROETHANE	UG/L	0.05	5	(A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5	(D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750	(D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5	(A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200	(D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6	(D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17	(D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE	
BENZENE	UG/L	0.05	5	(A1)
BROMOFORM	UG/L	0.20	350	(A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5	(A1)
CHLOROBENZENE	UG/L	0.10	1510	(D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350	(A1+)
CHLOROFORM	UG/L	0.10	350	(A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70	(D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350	(A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50	(D1)
ETHYLBENZENE	UG/L	0.05	2.4	(A3)
M-XYLENE	UG/L	0.10	300	(A3*)
METHYLENE CHLORIDE	UG/L	0.50	50	(A1)
O-XYLENE	UG/L	0.05	300	(A3*)
P-XYLENE	UG/L	0.10	300	(A3*)
STYRENE	UG/L	0.05	100	(D1)
TETRACHLOROETHYLENE	UG/L	0.05	65	(A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70	(D1)
TOLUENE	UG/L	0.05	24	(A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350	(A1)
TRICHLOROETHYLENE	UG/L	0.10	50	(A1)
VINYL CHLORIDE	UG/L	0.10	2	(D1)
RADIONUCLIDES				
TRITIUM	BQ/L	7.0	40000	(A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55#	(D1)
GROSS BETA COUNT	BQ/L	0.04	N/A	
COBALT 60	BQ/L	0.70	N/A	
CESIUM 134	BQ/L	0.70	N/A	
CESIUM 137	BQ/L	0.70	50	(A1)
IODINE 131	BQ/L	0.70	10	(A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input – Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY
All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS
Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS
Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME
Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION
This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

   i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

   ii/ the water being sampled is not being modified by the sampling system;

   iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

   iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME:	BENZENE
CAS#:	71-43-2
MOLECULAR FORMULAE:	C_6H_6
DETECTION LIMIT:	(FOR METHOD POCODO) 0.05 μg/L
SYNONYMS:	BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27) CYCLOHEXATRIENE (41)
CHARACTERISTICS:	COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)
PROPERTIES:	SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41) THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER THRESHOLD TASTE: 0.5 mg/L IN WATER (39) ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)
SOURCES:	COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST. ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.
USES:	DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.
REMOVAL:	THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION
ADDITIONAL PROPERTIES:	MOLECULAR WEIGHT: 78.12 MELTING POINT: 5.5^{o}C (27) BOILING POINT: 80.1^{o}C (27) SPECIFIC GRAVITY: 0.8790 AT 20°C (27) VAPOUR PRESSURE: 100 MM AT 26.1^{o}C (27) HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41) LOG OCT./WATER PARTITON COEFFICIENT: 1.95 TO 2.13 (39) CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41) SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry
- −500 mL plastic bottle (PET 500)
- −rinse bottle and cap with sample water three times
- −fill to 2 cm from top

Bacteriological
- −220 mL plastic bottle with white seal on cap
- −do <u>not</u> rinse bottle, preservative has been added
- −avoid touching bottle neck or inside of cap
- −fill to top of red label as marked

Metals
- −500 mL plastic bottle (PET 500)
- −rinse bottle and cap three times
- −fill to 2 cm from top
- −add 10 drops nitric acid (HNO_3)
  (**Caution:** HNO_3 is corrosive)

Volatiles (duplicates)
(OPOPUP)
- −45 mL glass vial with septum
  (teflon side must be in contact with sample)
- −do <u>not</u> rinse bottle
- −fill bottle completely without bubbles

Organics
(OWOC),(OWTRI)
- −1 L amber glass bottle per scan
- −do <u>not</u> rinse bottle
- −fill to 2 cm from top

Specific Pesticides
(OWCP),(PEOP),(PECAR)
- −as per Organics
- −three extra bottles must be filled

Polyaromatic hydrocarbons
(OAPAHX)
- −1 L amber glass bottle per scan
- −do <u>not</u> rinse bottle
- −fill to 2 cm from top
- −add 25 drops of sodium thiosulphate

Cyanide (Treated only)
- −500 mL plastic bottle (PET 500)
- −rinse bottle and cap three times
- −fill to 2 cm from top
- −add 10 drops sodium hydroxide (NaOH)
  (**Caution:** NaOH is corrosive)

Mercury
- −250 mL glass bottle
- −rinse bottle and cap three times
- −fill to top of label
- −add 20 drops each nitric acid (HNO_3)
  and potassium dichromate ($K_2Cr_2O_7$)
  (**Caution:** HNO_3&$K_2Cr_2O_7$ are corrosive)

```
Phenols                         -250 mL glass bottle
                                -do not rinse bottle, preservative has been added
                                -fill to top of label

Radionuclides                   -4 L plastic jug
(as scheduled)                  -do not rinse, carrier added
                                -fill to 5 cm from top

Organic Characterization        -1 L amber glass bottle; instructions
(GC/MS - once per year)          as per organic
(PBVOL),(PBEXT)                 -250 mL glass bottle
                                -do not rinse bottle
                                -fill completely without bubbles
```

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.

2. Record time of day on submission sheet.

3. Record temperature on submission sheet.

4. Fill up all bottles as per instructions.

5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

```
General Chemistry               -500 mL plastic bottle (PET 500)
                                -rinse bottle and cap with sample water three
                                 times
                                -fill to 2 cm from top

Metals                          -500 mL plastic bottle (PET 500)
                                -rinse bottle and cap three times
                                -fill to 2 cm from top
                                -add 10 drops nitric acid (HNO₃)
                                 (Caution: HNO₃ is corrosive)
```

Steps:

1. Record time of day on submission sheet.

2. Place bucket under tap and open cold water.

3. Fill to predetermined volume.

4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500)
	-rinse bottle and cap with sample water three times
	-fill to 2 cm from top

Bacteriological   -250 mL plastic bottle with white seal on cap
                         -do <u>not</u> rinse bottle, preservative has been added
                         -avoid touching bottle neck or inside of cap
                         -fill to top of red label as marked

Metals   -500 mL plastic bottle (PET 500)
                         -rinse bottle and cap three times
                         -fill to 2 cm from top
                         -add 10 drops nitric acid HNO_3
                         (Caution: HNO_3 is corrosive)

Volatiles (duplicate)   -45 mL glass vial with septum
(OPOPUP)   (teflon side must be in contact with sample)
                         -do <u>not</u> rinse bottle, preservative has been added
                         -fill bottle completely without bubbles

Organics   -1 L amber glass bottle per scan
(OWOC)   -do <u>not</u> rinse bottle
                         -fill to 2 cm from top

Polyaromatic Hydrocarbons   -1 L amber glass bottle per scan
(OAPAHX)   -do <u>not</u> rinse bottle
                         -fill to 2 cm from top
                         -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.